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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

CAPITAL ASSISTANCE PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

KOREA - SMALL/MEDIUM SCALE IRRIGATION PROJECT

AID-DLC/P-2025

UNCLASSIFIED

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

UNCLASSIFIED

AID-DLC/P-2025

May 14, 1974

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Korea - Small/Medium Scale Irrigation Project

Attached for your review are the recommendations for authorization of a loan to the Government of the Republic of Korea in an amount not to exceed Seventeen Million Two Hundred Thousand Dollars ($17,200,000) to be made available to assist in financing the local currency costs of completing the construction of a number of small/medium-scale irrigation systems.

The loan proposal is scheduled for consideration by the Development Loan Staff Committee on Thursday, May 23, 1974. Also, please note your concurrence or objection is due by close of business May 29, 1974. If you are a voting member a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development
Program Review

Attachments:

Summary and Recommendations
Project Analysis
ANNEXES A - D

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AID-DLC/P-2025
May 14, 1974

KOREA - SMALL/MEDIUM SCALE IRRIGATION PROJECT

SUMMARY AND RECOMMENDATIONS

1. Borrower: The Government of the Republic of Korea (ROKG). The project will be implemented by the Agricultural Development Corporation (ADC) of the Ministry of Agriculture and Fisheries.

2. Amount of Loan: $17.2 million.

3. Terms: Repayment within 40 years, including a ten-year grace period; interest at 2% annually during the grace period, and 3% thereafter.

4. Purpose: To assist by accelerating ROKG efforts to expand the production of rice and barley through the utilization of water resources in small/medium scale irrigation projects and thereby assist up to approximately 95,000 farmers to increase their net incomes by an average of $412 per year.

5. Project Description: The completion of up to 66 subprojects, currently in various stages of construction, is defined as the "Project." These sub-projects include primarily pumping and reservoir type irrigation systems and they are located throughout the country.

6. Project Costs and Financing Arrangements: Total costs of completing these 66 subprojects is currently estimated to be $65.3 million. Of this amount it is proposed that AID finance $17.2 million. These funds would be available on a reimbursement basis to finance 75% of certain designated local costs of each subproject. Such reimbursement would take place only after individual sub-projects are certified to AID as being satisfactorily completed.

7. Other Sources of Financing: Other sources of financing to assist this Project are not presently available.

8. Mission Views: USAID/Korea views this Project as being a key element of its current program which emphasizes support for the ROKG's efforts to speed the development of the rural/agricultural sector, and accordingly recommends early authorization of the proposed loan.

9. Issues: None

10. Statutory Criteria: All statutory criteria have been satisfied (see Annex C).

11. Recommendation: Authorization of a loan to the ROKG in the amount of $17.2 million to finance up to 75% of certain local costs of completing subprojects from among the 66 identified, subject to the terms and conditions stated in the draft loan authorization attached as Annex D.

USAID Project Committee

Agricultural Advisor and Chairman	Francis C. Jones, RDD
Loan Officer	Robert A. Cahn, DLD
Legal Advisor	John W. Roxborough, LEG
Engineer	James Thomas
Irrigation Engineer	William D. Romig
Controller	William A. Chevoor

AID/W Project Committee

Loan Officer and Chairman	M. Milburn Pehl, ASIA/CD
Agricultural Advisor	Robert Morrow, ASIA/TECH
Engineer	Lester Robb, ENGR/OPNS
Country Desk Officer	Blaine Richardson, ASIA/EA/K
Legal Advisor	Jay A. Burgess, GC/ASIA

Drafting Officers - Jones/Romig/G.Lehman/Roxborough/Thomas/Cahn/Pehl

5/10/74

KOREA - SMALL/MEDIUM IRRIGATION SCALE PROJECT ($17.2 million)

Table of Contents

I. Background

A. Agriculture in the Korean Economy

The dramatic growth and development of the Korean economy since the early 1960's is a matter of historical record which has been amply documented in reports of the major international lending institutions and the Government of Korea (ROKG). It is also well recognized by the ROKG and the international lenders that the pattern of development under the first two Five Year Plans (1962-1966 and 1967-1971) heavily emphasized basic infrastructure and export-oriented industry at the expense of agriculture. During the ten-year period 1959-1969, the average annual growth rate of the total economy was 8.2 percent, while agriculture, forestry and fisheries grew at a rate of 4.2 percent. For agriculture alone the rate of growth was 3.8 percent. While this is a respectable rate for the agricultural sectorin a developing country, agriculture has not been able to meet the demands of the rapidly expanding urban sector. The result has been an increase in the agricultural products trade deficit from $64 million in 1961 to $363 million in 1971. Rural income per household has increased more slowly than urban household income - 360 percent from 1962 to 1972 for rural households compared with 840 percent for urban.

Notwithstanding the fact that the agricultural sector was relegated to a back seat during the period 1962-1971, the importance of the sector to the development of the total economy is fully appreciated by the personnel and institutions developing and guiding the implementation of the five year plans. The decision to emphasize the non-farm sectors in earlier years appears to have achieved the desired results, i.e., rapid industrialization. Now more attention will be given to agricultural development. This shift in emphasis is reflected in the Third Five Year Plan (1972-1976). Greater equity in income distribution, meeting social needs through improved rural services, increased production (especially in the critical area of food grains), and development of land and water resources are major objectives of the current development strategy.

B. Korean Agricultural Sector Analysis and Priorities

The AID financed Korean Agricultural Sector Study carried out in 1971-1972 by Michigan State University and the Ministry of Agriculture and Fisheries recommended investment in eight specific agricultural sub-areas in the following order of priority:

Agricultural Research
Transportation (roads)
Irrigation
Drainage
Credit and Grain Management Policy
Market Information
Storage facilities (grain and pulses)
Upland Development

In January 1974 AID entered into a loan agreement with the ROKG to provide $5 million over a five year period for assistance to agricultural research on rice, barley, wheat, soybeans and cropping systems. The project is designed to achieve breakthroughs in the development of significantly higher yielding, resistant varieties of these crops through concentrated multidisciplinary research. Loan money will be used to bring 11 full time American scientists to Korea to work with scientists of the Office of Rural Development, to train Korean researchers at institutions in the United States and in third countries, and to purchase selected research equipment. The ROKG is increasing its budgets for research on these commodities by the won equivalent of $625,000 per year. The total research effort in these areas will now be more than 2.5 times the effort in recent years.

The second priority investment areas as recommended by the Korean Agricultural Sector Study was roads. Needs here are being adequately taken care of by ROKG and other donor resources, including IBRD's.

This loan addresses itself to the third priority area - assistance in acclerating the completion of ongoing small/medium scale irrigation projects. Thus benefits in the form of increased food production and higher farm incomes will be realized sooner than would be the case if the completion of this Project was dependent solely upon Korean resources.

While the Korean Agricultural Sector Study recommended foreign lender assistance in completing ongoing small/medium scale irrigation projects having reasonable economic returns, the recently completed IBRD Agricultural Sector Survey did not comment on these. However, the IBRD Survey did come down heavily in favor of making future irrigation projects an integral part of area development projects. The IBRD team especially noted the ROKG proposal to start some 5,000 new irrigation projects averaging 30 hectares in size. The team was concerned that these projects would have drainage and water supply problems and also with the fact that site surveys, design and construction supervision were to be carried out by local governments. The Survey went on to say, however, that it was likely that more detailed analysis would show that some discrete irrigation projects (i.e. those not a part of total area development) merited investment. The proposed AID project avoids the drawbacks about which the IBRD team was concerned as it is to assist in the completion of projects that have been surveyed and designed by the Agricultural Development Corporation and construction is supervised by the ADC. The 88 proposed irrigation systems * are of a size and nature that will avoid drainage and water supply problems, and all those that AID will assist will have relatively high incremental internal rates of return.

Area development projects may well make better sense for the future. However, if rice production is to be increased significantly by 1976 (a goal of the Third Five Year Plan), most of the increase will have to come from the establishment and improvement of discrete irrigation systems, since the larger scale area development projects, with the

* Note: In this paper the term "system(s)" is used when referring to one or more of the 88 proposed irrigation systems; the term "subproject(s)" is used to refer to 66 of these 88 systems proposed as eligible for AID financing; and collectively all of the subprojects are referred to as the "Project."

exception of the IBRD Pyongtaek-kumgang and YongSan Gang Stage 1, will not be completed until the late 1970's. The IBRD Survey recognized this when in projecting an increase in rice production of 344,000 MT by 1976, it showed 70 percent of this increase coming from new or improved individual irrigation systems.

C. Need for Irrigation

Korea has relatively abundant water resources, but an unfortunate seasonal distribution of rainfall coupled with a mountainous topography. It has been estimated that only about 13 percent of the total annual precipitation is being utilized for agricultural, industrial and home purposes. The most important period for application of irrigation water is in early June for puddling and planting rice, but generally rainfall in June is not sufficient. Also, there are frequently drought periods in August and/or September which markedly reduce rice yields. In one of the reports prepared under the United Nations Upland Development and Watershed Management Project, it was estimated that in an average rainfall year only 58 percent of the total water requirement for optimum rice yields is provided and in a typical drought year only 46 percent is provided. In another study conducted under the same project it was estimated that without irrigation, rice yields in 8 years out of 30 would be 20 percent or less of optimum, whereas with full irrigation, yields below 20 percent of optimum would occur in only 2 years out of 30. At the other end of the scale the study showed that without irrigation, yields 90 percent and above of optimum would occur in only 15 years out of 30 whereas with full irrigation this level of yields would occur in 24 years out of 30. These data clearly indicate the importance of irrigation for rice production by preventing extreme yearly fluctuations in yields due to climatic conditions.

Although estimates vary, it appears that only about 650,000 hectares of Korea's one million hectares of paddy land suitable for irrigation is fully irrigated. The 88 systems would fully irrigate 48,000 hectares, or 14 percent of the 396,000 hectares remaining to be irrigated. In addition it is contemplated that about 17,000 hectares of non-paddy land will be converted to irrigated paddy.

D. History of Irrigation Improvement in Korea

Irrigation improvement projects were undertaken beginning in 1906, and 290 thousand hectares of paddy land in 598 districts were brought under irrigation during the period of 1906 through 1945.

The Korean War of 1950 through 1953 destroyed or damaged most of the irrigation facilities constructed in the past. After the Korean War various international donors such as UNKRA, FAO, and ICA provided much help for reconstruction of the damaged or destroyed facilities by giving aid in funds or materials together with technical assistance. Irrigated paddies increased to 399,034 hectares in 14,315 districts by 1965.

The unprecedented severe drought of 1967 - 1968 caused serious losses to the nation's economy and made agricultural production unstable. Following the drought the "All Weather Farming Program" was designed in 1968 by the Government to protect rice and other crops from the effects of drought. Under the program the ratio of irrigated paddy land was to be increased to 90 percent of the then present level by 1976.

During this history the Farmland Improvement Associations (FLIAs) were developing into viable organizations for assisting farmers. As of June 1, 1973, there were 127 FLIAs covering 450,000 hectares of cultivated land throughout the country.

E. Non-availability of Financing from Others

A project proposal for completing these systems was presented by the ROKG to the Consultative Group meeting in Paris in December of 1972. Subsequently no donor other than AID indicated an interest in considering this Project. Since the other donors to Korea are planning to provide their programmed amounts in support of other activities, there is really no alternative financing available for this Project.

F. Relationship to AID Priorities

The anticipated results from the Project financed by the proposed loan include not only significant increases in domestically produced rice and barley but substantially enhanced incomes for the up to 95,000 relatively poor families who now own and farm the lands to be benefited by the Project.* (See Section VI, Impact on People). In addition it will strengthen the Farm Land Improvement Associations which in effect are local cooperative water districts which operate, maintain, and manage all aspects including collection of water charges and debt servicing of the irrigation subprojects after completion of construction and formal acceptance. The loan thus fits the FAA Sec. 103 Food and Nutrition category since it will provide basic services (irrigation water) to poor farmers and enhance their capacity for self-help by making it possible for them to grow more food through more intensive land use and thus earn more net income.

* While the Project is defined as completion of construction on 66 subprojects, it should be noted that the proposed AID loan of $17.2 million for financing 75% of the costs from 1/1/74 of these will finance only a portion of the 66 subprojects since these have a remaining total cost of $65.3 million.

II. Institutional Aspects

A. Role of Various Organizations and Groups

The Ministry of Agriculture and Fisheries (MAF) is in charge of land and water resources development, except in the case of multi-purpose and river basin development projects which are the responsibility of the Ministry of Construction. Under MAF, the Farm Land Bureau overseas the nation-wide land and water programs. The Agricultural Development Corporation (ADC) is the main technical and construction agency under MAF. The following table shows the general pattern of administrative responsibilities of various agencies and sources of finance for the contemplated irrigation subprojects.

Administrative Responsibility and Sources of Finance for Irrigation Subprojects /1

	Sizes of Projects	
	Small	Medium
Size of command area (ha)	50-1,000	over 1,000
Responsibility:		
Survey and design	ADC	ADC
Execution of construction	Private contractors (paid by FLIA)	Private contractors (paid by ADC)
Construction supervision	ADC	ADC
Operation and maintenance	FLIA	FLIA
Source of finance (%)		
MAF subsidy	70	70
MAF loan	30	30
Total	100	100

ADC designs and supervises construction of all subprojects and FLIAs operate and maintain them. The payment distinction is discussed in section 1 below.

/1 ADC refers to Agricultural Development Corporation, FLIA to Farm Land Improvement Association, and MAF to Ministry of Agriculture and Fisheries.

Under policy guidance of the Economic Planning Board (EPB) and applicable laws and regulations, the MAF releases budgetary funds to ADC and the FLIAs and monitors ADC and FLIAs performances. MAF is, and will continue to be, the channel for policy considerations regarding the substantive aspects of the Project to be financed by the prospective AID loan. USAID has confidence that MAF and EPB will give this Project sufficient priority and funding to assure acceptable Project progress and timely completion.

1. The Agricultural Development Corporation (ADC)

ADC, a semi-autonomous public entity within the Ministry of Agriculture and Fisheries, has overall responsibility for Project execution. Established in early 1970 through consolidation of the Union of Land Improvement Associations and the Groundwater Development Corporation under the Rural Development Promotion Law, ADC has broad responsibilities for the development of land and water resources in rural areas throughout Korea. Although a relatively new organization, ADC has through its employees and predecessor agencies long experience in managing construction of irrigation projects. ADC is headed by a president, a vice president and a board of directors consisting of four members. The president and vice president are appointed for a four-year term by the President of the Republic of Korea, while the directors and other senior staff are appointed by ADC's president. The corporation is divided into six departments ---General Affairs, Survey and Design, Construction, Kumgang - Pyong Taek project, Foreign Services and the Agricultural Engineering Research Center.

ADC has a main office in Seoul and eight branch offices. Field offices are established at each project site for survey and supervision of construction works.

ADC employs 1,600 people among whom there are 1,200 engineers and technicians, drawn from different specialized disciplines. Most of them are graduates of Korean universities and some 65 received degrees abroad.

ADC and its predecessors have completed 11,000 projects, including 700 dams, 330 pumping plant, 160 diversion weirs and 9,800 projects for tubewells, bridges, tidal land reclamation, harbors and hydropower.

ADC sets up a training program every year for its engineers and sends some abroad for specialized training. Some engineers are assigned to construction projects, testing laboratories and inspection in manufacturers' plants for continuing education in new techniques. They also attend international engineering conferences. Such continuing efforts to upgrade professional skills are applied to all engineering work.

ADC has an Agricultural Engineering Research Center equipped with 2,700 pieces of testing apparatus. The center carries out soil, soil mechanics and construction materials testing, as well as hydrologic studies and tests using hydraulic models.

ADC owns and maintains 300 pieces of heavy construction equipment for renting to construction contractors and FLIAs.

Specialists experienced in procurement matters handle purchasing and inspection of construction materials and construction equipment.

ADC has done the detailed studies for all 88 systems. The material is voluminous and on a random sampling basis has been found to conform to good professional standards. The findings have not been reduced to report form but the data is there for each subproject and would be made available to USAID should it be needed during Project execution.

ADC will supervise construction on all subprojects to be included in the AID financed project. Thus the resident engineer for all AID financed subprojects will be an ADC employee. On 21 of these subprojects payments to the contractors are made directly by ADC. For the rest of the subprojects payment is made by the FLIA concerned but only after the ADC resident engineer and the supervising ADC Branch office have countersigned the contractor's invoice.

All progress reporting and accounting for the approved subprojects will be coordinated by ADC. The latter has an established monthly reporting system for these subprojects which has been examined by several members of the Project Committee and found to be adequate.

The Project Committee considers that ADC has sound management and adequate staff to handle the acceleration of subprojects under the proposed loan in addition to its other work, including the IBRD-funded activities. This is because actual construction is carried out by private contractors. The 88 systems are all on-going efforts that are staffed based on the past rate of anticipated funding. Likewise, all basic design work has been completed. Little extra staff will be needed to permit a significant acceleration. The on-site staff normally includes a resident engineer (ADC) and an inspection team (ADC and FLIA) consisting of two members. At most, the larger projects might need an additional inspector or two. Such personnel are normally engineers-in-training or technicians. The on-site staff is supported and supplemented by the Provincial Office (or in some cases an

Intermediate District office). These offices seem adequately staffed. It was noticed that, in the three Provincial Offices contacted, the basic staff exhibited a permanence of personnel that is unusual by U.S. engineering standards. Key personnel generally had twenty to twenty five years of service, usually all in that one location. It appears that there is a reluctance to move to other communities. This tends to stabilize such offices.

Korea has a substantial engineering workforce providing a reserve of talent and ADC has been able to attract the engineers it needs. Pertinent to this question, the ADC in recent years has felt that its basic staff was adequate to handle its own work load and to undertake consulting services in other countries. Its motivation was two-fold; first to provide employment for specialists or experts not currently needed in the Korean program, and second to provide a wider base of experience for its employees. If the program of the ADC were threatened by understaffing, it would undoubtedly return some of this overseas staff to Korea as rapidly as its obligations would permit. This would provide a reserve of the more experienced and more expert personnel, if needed, to augment Seoul and Provincial Offices.

Because of its size, the Sin-gog subproject might seem to present a particular staffing problem. However, it also is an on-going effort with an existing staff on the job. Also, as with the others, the basic design work is completed. The major need is supervision of construction, including inspection. An acceleration of the work would probably require some added personnel. However, the increased personnel would not be proportional to the increased rate of work. Inspectors would have fewer sites to watch which would reduce the time of travel between sites, increasing the effectiveness per man appreciably. Also, adequate inspectors are generally the easiest class of engineering personnel to obtain and to train. If the work were threatened by delay due to a lack of ADC personnel, the Project Committee is confident that the FLIA would assign additional personnel to work with the ADC to keep the work moving.

2. Contractors

For each subproject there is normally one prime private construction contractor selected on the basis of his low bid. In preparing his bid, unit prices may range from 80% to 100% of the official unit costs established for that year by the Economic Planning Board and he has flexibility in pricing his override (the indirect costs including contingency, overhead, profit, etc.). The selected contractor is retained to complete the project provided his work is satisfactory, but the contract is funded only one year at a time. New prices are negotiated in succeeding years based on the new EPB established official unit costs. The amount of work to be done is fixed by budget availability and the new costs. The contractor posts a Performance Bond in the amount of 10% of the contract cost for each annual contract amount. There has been an excellent record of performance with only limited instances of failure.

3. Self Help by Farmers

The to-be-benefitted farmers are required to contribute labor or the equivalent to assist in the construction of some common use features of the irrigation systems. On a sample basis this appears to amount to about 10% of the capital costs. In addition land conversion (leveling, terracing, etc. within a farm plot) is the responsibility of the farmer. Basically he either does this himself or trades off labor and equipment with his neighbors to accomplish it. The value of both of these types of labor has been included in IRR calculations. These cost elements, however, are to be excluded in calculating AID's 75% reimbursement of remaining capital costs of completed subprojects--see Sec. VIII.

4. Farmland Improvement Associations

The Farm Land Improvement Associations (FLIA) show a remarkable similarity to the Irrigation Districts of the Western United States. These are associations of farmers with a common interest in the continued success of an irrigation system. This arrangement has proven, in the U.S., to be generally much more successful than the private irrigation company in business to supply water. The FLIA, like the U.S. Irrigation District, has the authority to "tax" the water-users for funds for the operation and maintenance of the irrigation system and for repayment of debts of the FLIA. Because of the direct farmer involvement, the management must do a satisfactory job and becomes very sensitive to the farmers' needs.

Field inquiries as to the number and type of personnel on FLIA staff indicated about the same level as in the U.S. The level of equipment ownership is somewhat lower. This is due, in part, to the availability of off-season farmer labor at relatively low cost. It also tends to result from the availability of rental equipment from the ADC and the use of contractors when equipment is needed.

Project operation and maintenance is handled by the FLIAs. The many kilometers traveled by car afforded the Project Committee irrigation engineer an opportunity to observe many older projects, up to twenty years old. In none of these were cases of inadequate maintenance observed. A few instances of deteriorating concrete were noticed, but not to the extent of needing replacement and not to an unusual degree. The turf of the downstream side of dams was in excellent shape. The Irrigation Engineer rates the maintenance operations of the FLIAs as slightly better than the average Irrigation District of comparable size in the United States, probably because of the greater availability of hand labor.

5. Other Required Inputs and Farm Product Marketing

Agricultural inputs (fertilizer, insecticides, pesticides, seeds) are widely available to farmers through both public and private marketing systems. While these systems undoubtedly could be improved, and need to expand considerably in future years, they have demonstrated a capacity to get purchased inputs to farmers in a reasonably efficient manner. For example, fertilizer usage by farmers has increased from 393,000 MT in 1965 to over 800,000 MT in 1973, or slightly over 100 percent. Annual rates of increase have been particularly marked during the past two years, being 20 percent in 1972 and 13 percent in 1973, largely as the result of government's high grain price policy. The IBRD Agricultural Sector Survey states, "A highly developed system of farmer cooperatives has enabled the government to carry out successful programs for ... distributing fertilizer and other inputs required to expand crop and livestock production and increasing commercial marketings of agricultural products."

Korea has rather sizeable fertilizer manufacturing capacity much of which has been AID financed. Until 1973, production has been sufficient to meet Korea's own needs and to export a small amount. In 1973, a small amount was imported. However, new production is coming on stream, expansions of existing plants are underway or planned and a major new facility (the "Seventh Fertilizer Plant") is well along in planning. The ROKG and the investors in these plants are being careful to ensure long term raw material availability. The Project Committee feels prospects are excellent that Korea's overall needs for fertilizer in the long run will be met.

The agricultural extension (guidance) service is much more advanced than in other developing countries, and through past performance has demonstrated the ability to perform in a more than adequate manner. A notable example of its capacity was its performance in disseminating information to farmers concerning the planting and cultivation of IR 667 rice in 1972, the first year in which that newly developed variety was planted extensively. Similar experiences have occurred in the case of the rapidly developing mushroom, livestock, and fruit and vegetable industries.

Storage facilities in terms of total capacity are probably adequate but the quality of storage needs to be improved. AID assisted in improving both quantity and quality in 1972 when it financed the construction of 675 myon (district) level warehouses. The Government is continuing to build new storage facilities of a high standard.

Adequate marketing arrangements already exist and it can safely be assumed that they will be expanded as required to absorb the increased production of the proposed project.

B. Overall Capability for the Carrying Out and Operation of the Project

In light of the above favorable findings on the capabilities of the entities involved in this proposed Project, namely the Economic Planning Board; Ministry of Agriculture and Fisheries; the Agricultural Development Corporation; the Farmland Improvement Associations; the other agencies of MAF; contractors; other private firms concerned with farm inputs, storage and marketing; and last but not least the shrewdness and adaptability of the farmers, the Project Committee finds excellent prospects for a successful Project.

III. Project Description, Project Costs and Financial Plan

A. General

The ROKG has proposed that AID loan it a minimum of $30,000,000 over a two year period to assist it in the early completion of 88 small to medium size irrigation systems.

The Project Committee irrigation engineer reviewed the technical plans and specifications for, and made visits to the sites of, a representative sample (14) of these proposed subprojects. The Committee also made an economic analysis of each of the 88 systems. On the basis of these reviews and analyses, the Committee decided that AID should select as eligible for AID financing only those subprojects which have an incremental Internal Rate of Return (IRR) of 22% or higher. This would make eligible 66 subprojects for AID financing.

B. Project Description

The 66 subprojects already have major investments in place, but sufficient funds are not available for prompt completion. Enough work has been completed on many of the subprojects so that relatively modest inputs can get at least part of the irrigation started. In fact some are already irrigating a part of the potentially irrigable area. Some probably will be serving new areas before the end of the first construction season given an adequate level of funding.

In some of the larger pump irrigation schemes there is basically a stage development possibility where blocks of land can come under irrigation when certain key facilities are constructed. Some of these (such as the Sin-gog subproject) have very clear cut stages. Others are not so sharply defined since some works serve several "stages" and the extent of new irrigation may depend less on the completion of key structures. A staged development concept might apply to some reservoir subprojects and some drainage subprojects, but the effect is not so obvious.

In general, but not always, the smaller subprojects tend to be an "all or nothing" situation. The key structures whether a dam, pumping station or weir are usually to be the last finished under any funding situation. The drainage schemes also tend toward an "all or nothing" situation. When the main pumping station is operable, some benefit may

result, but generally all secondary pumps and all drainage canals will be needed before there will be significant benefit from the installation.

Land consolidation, or paddy rearrangement, is a firmly fixed and implemented policy of the ROKG. Many of the proposed subprojects will have land consolidation as part of subproject construction, some will not. In the latter case consolidation may come along in later years if the farmers decide that the benefits would significantly outweigh the costs. In the following economic and financial analyses the costs and benefits of land consolidation have been excluded since this is a separate effort by other ROKG agencies and is not uniformly a complementary effort for each subproject.

Table 1, in the Annex presents among additional data the type of irrigation system, the benefited area, total construction cost and remaining cost for each subproject. The application data include more details on the remaining construction elements of the subprojects. The complete (and voluminous) subproject study materials are available from ADC.

The design engineering for all subprojects has been completed. For all structures, except those specialized structures such as major pumping stations, standard design drawings following closely the U.S. Bureau of Reclamation pattern are used. The engineering and detailed design work for a representative sample of subprojects was examined in sufficient detail to assure that design and engineering work confirms with good engineering practice and meets Section 611 requirements.

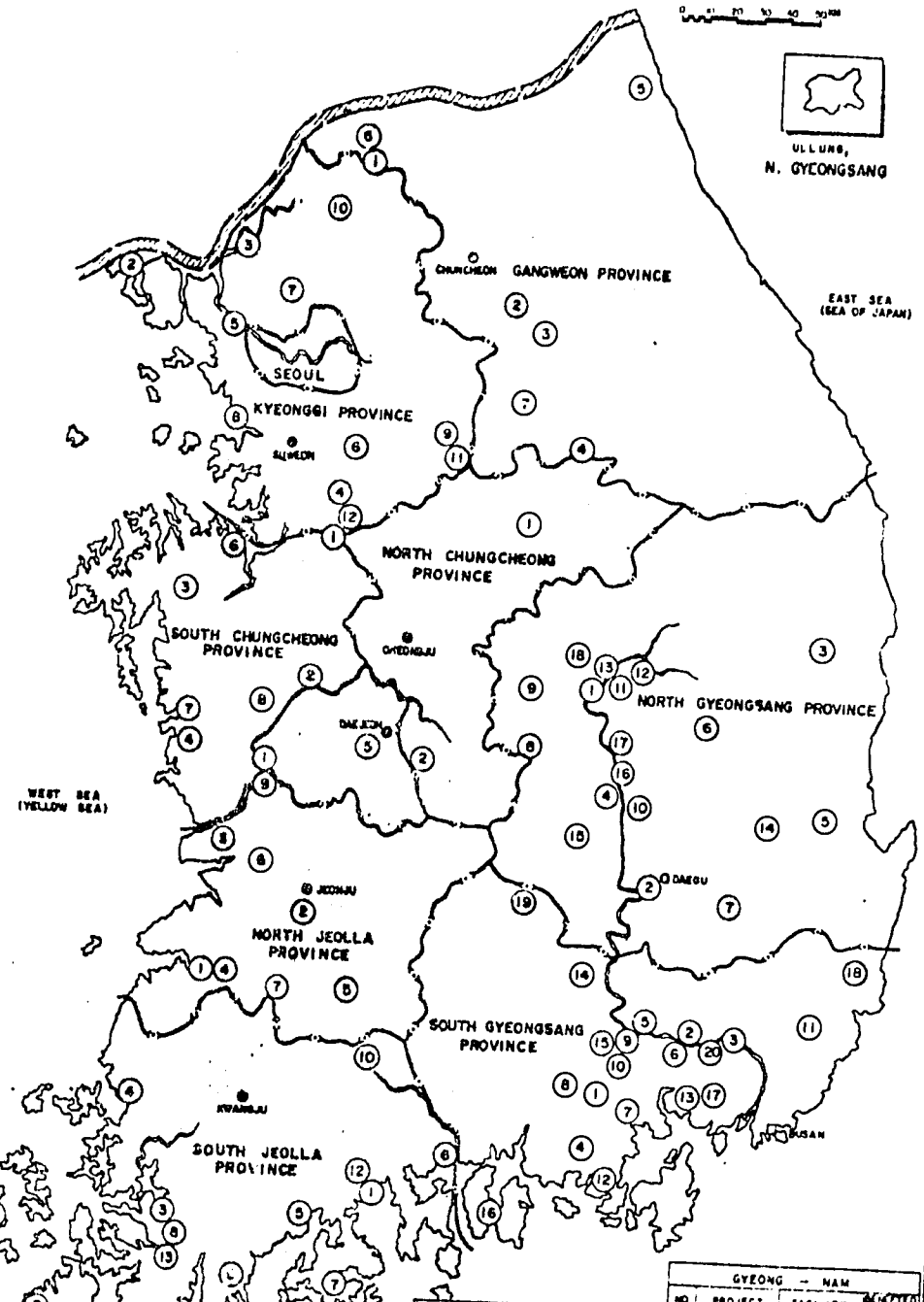
Table 2, in the Annex is a cross reference to the Location Map (next page) so that the subprojects proposed for AID financing can be found among the 88 systems shown thereon. It should be noted that the subprojects are spread throughout the country.

Annex A contains excerpts from the Project Committee irrigation engineer's overall report. These cover information derived from site visits to three subprojects: Sin-gog, Na-po, and An-deok (An-deog).

C. Project Costs and Financial Plan

The incremental costs (based on current prices) for completing the 66 irrigation subprojects total 26.1 billion won or $65.3 million U.S. dollars. The cost estimates for individual subprojects are listed in Table 1 of the Annex. Funds available for financing these subprojects include $15.2 million equivalent from the ROKG and the A.I.D. loan of $17.2 million for a total of $32.4 million. This will permit a substantial number of the 66 subprojects to be completed, leaving a residual requirement for further financing of approximately $32.9 million to complete the remainder of the subprojects to a total of 66. The tabulation following the map sets forth the use and source of funds for financing the incremental Project costs and shows how the A.I.D. loan is attributed to completed subprojects.

THE MAP OF IRRIGATION PROJECT



KYEONG – GI

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	CHEONG – YONG	RESERVOIR	877
2	GYU – DONG	PUMPING STATION	600
3	IM – JIN	"	760
4	TI – DONG	RESERVOIR	2,160
5	SIN – GUA	PUMPING STATION	15,026
6	DO – CHEJA	RESERVOIR	192
7	BACK – SEOK	"	180
8	GUN – AM	PUMPING ST	288
9	NEUNG – SEO	PUMPING STATION	2,026
10	GOONG – PYONG	"	210
11	YEO – JU	"	180
12	MA – DUK	RESERVOIR	300

GANG – WEON

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	CHEOL – WEON	RESERVOIR	2,902
2	HWA – CHON	"	200
3	GAE – WON	"	136
4	HWANG – DUN	"	122
5	GEO – JIN	"	500
6	GONG – SONG	"	602
7	O – WEON	"	180

CHUNG – BUK

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	EXPANSION OF KEUM – DONG	PUMPING STATION	869
2	DONG – YI	RESERVOIR	780

CHUNG – NAM

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	JANG – HA	PUMPING STATION	231
2	JEONG – AN	RESERVOIR	887
3	KO – PUNG	"	1,467
4	CHANG – DONG	INTAKE – WEIR	954
5	HAK – HA	RESERVOIR	837
6	CHO – DAE	"	800
7	SOONG – YOON	"	300
8	WUN – GOK	"	820
9	SE – DO	PUMPING STATION	817

JUN – BUK

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	GO – DEOK	RESERVOIR	509
2	AN – DEOK	"	201
3	NA – PO	PUMPING STATION	449
4	JEON – EUP LATERAL	FEED CANAL	2,823
5	DO – BONG	RESERVOIR	78
6	MAN – KYUNG RIVER	WEIR	2,098
7	SSANG – CHI(D)	RESERVOIR	109

JUN – NAM

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	DAE – HYONG	RESERVOIR	420
2	JI – SAN	"	408
3	DO – GAP	"	147
4	YONG – AM	"	169
5	DEOK – SAN	"	465
6	MANG – DEOK	PUMPING STATION	320
7	KEUM – SA	RESERVOIR	288
8	BONG – WEOL	"	70
9	SEONG – SAN	"	140
10	AU – MAN	"	816
11	DO – CHO	PUMPING STATION	243
12	BANG – SONG	RESERVOIR	80
13	O – RYU		180

GYEONG – BUK

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	MAE – HO	PUMPING STATION	546
2	WOOL – SEONG	STATION FOR DRAINAGE	460
3	CHANG – SOO	RESERVOIR	199
4	GANG – JEONG	STATION FOR DRAINAGE	631
5	GI – GYE	RESERVOIR	276
6	JEOM – SOK	"	140
7	SONG – NAE	"	180
8	SONG – SEONG	"	1,000
9	EUN – CHEOK	"	134
10	GA – SAN	"	116
11	YANG – SEO	PUMPING STATION	2,937
12	PUNG – GANG	"	1,800
13	PUNG – YANG	"	1,669
14	HWA – BUK	RESERVOIR	180
15	CHO – JEON	"	334
16	IN – DEOK	"	110
17	YONG – AM	"	45
18	SAN – NAM	PUMPING STATION	320

GYEONG – NAM

NO	PROJECT	FACILITY	BENEFITED AREA ha
1	MYUNG – DUK	RESERVOIR	268
2	HA – RAE	STATION FOR DRAINAGE	818
3	SAENG – LIM	"	925
4	YANG – HWA	RESERVOIR	219
5	WU – GANG	STATION FOR DRAINAGE	367
6	CHANG – WEON	RESERVOIR	1,832
7	JOONG – BUK	"	189
8	MA – JIN	PUMPING STATION	156
9	HA – GI	"	553
10	YOON – NAE	STATION FOR DRAINAGE	650
11	SO – YEON	RESERVOIR	368
12	WEON – SAN	"	100
13	BULMO – SAN	"	220
14	CHO – GYE	PUMPING STATION	1,140
15	BAEK – GOK	STA FOR IRRIG DRAINAGE	275
16	DA – JEONG	RESERVOIR	86
17	JANG – YOO	PUMPING STATION	1,377
18	DONG – CEON	INFILTRATION	392
19	GA – JO	RESERVOIR	1,166
20	YI – BUK	STATION FOR DRAINAGE	364

LEGEND

⊙	PROVINCIAL SEAT
———	PROVINCIAL BORDER
⋋	RIVER
(8)	AREA NUMBER

FINANCIAL PLAN FOR "66" SUBPROJECTS
(in millions of won and millions of U.S. dollars)

	Incremental Subproject Costs		Costs of Subprojects Completed	
	Won	U.S.$	Won	U.S.$ 3/
Total Capital Requirements	26,135	65.3	9,173	22.9
Source of Funds				
ROKG	6,085 1/	15.2	2,293(25%)	5.7 (25%)
A.I.D.	6,880 2/	17.2	6,880(75%)	17.2 (75%)
Total	12,965	32.4	9,173(100%)	22.9 (100%)
Residual Funds Required to Complete Remaining Subprojects after A.I.D. loan fully disbursed	13,170	32.9		

1/ Includes 2,293 million won for completed subprojects, and 3,792 million won disbursed for subprojects still to be completed.

2/ A.I.D. contribution only to completed subprojects.

3/ Exchange rate used won 400 = $1.

The $17.2 million A.I.D. loan will finance 75% of the costs of completed subprojects. A.I.D. participation will permit the ROKG (ADC and FLIAs) to accelerate the completion of subprojects currently under construction. It is expected that about $10 million of the A.I.D. loan will be disbursed during calendar year 1974 and most of the remainder during calendar year 1975.

The ROKG budget already has been approved in the amount of 3.24 billion won, or $8.1 million, and the Government is proceeding to request a supplemental appropriation for an additional 2.845 billion won, or $7.1 million. The supplemental budget will permit further acceleration of completion of the irrigation subprojects. In order to encourage the ROKG to seek a special budget appropriation in the amount of $7.1 million, A.I.D. has agreed to provide for a $5 million advance. Thus, for every dollar A.I.D. is advancing, the ROKG will be making available $1.40 from its own budget. The advance will be deducted on a pro rata basis from reimbursements from completed subprojects. The procedures for reimbursement and planned advance are spelled out in Section VIII-A and Section VIII-C respectively.

The reimbursement formula, which provides for a 75%/25% A.I.D./ROKG contribution assures that the ROKG will pay a minimum of 25% of the total costs of the completed subprojects and thus meets the requirements of Section 110 of the Foreign Assistance Act. (In accordance with Agency procedures, confirmation of this will be obtained from the ROKG--as a covenant in the loan agreement.) In addition, the ROKG has paid for all of the capital investment costs incurred for each subproject through December 30, 1973, and beyond this each farmer is required to make further investment through labor or payment, as set forth in II-A-3 - Self Help by Farmers.

IV. Economic and Financial Analyses

A. Economic Analysis

Incremental economic internal rates of return (IRRs) are shown for each system in column (B) of Table 1 of the Annex. This analysis considers all of the investment through calendar year 1973 as a sunk cost and the IRRs therefore disregard these costs. Incremental benefits are the current values of the additional crop production which would stem from reasonably expected yield increases priced at estimated economic values for those crops. The incremental production costs to attain the incremental benefits are also included in the calculations. 1/

The Project Committee used these incremental economic rates of return as the principal indicators of economic viability and Table 1 of the Annex lists the systems in rank order from the highest rate of return to the lowest. As can be seen from Table 1 (column B) the economic IRRs for all 88 systems range from a high of 123% to a low of 12%. The proposed cut-off for AID financing is subproject No. 66 at 22% IRR. The balance of the systems below this group (not eligible for AID financing) are shown for informational purposes. The reason for this fairly high cut-off is the relatively high opportunity cost of capital in Korea which may be in the neighborhood of 20-25%. (The highest commerical bank overdraft rate found in current statistics is 20%.)

In these IRR calculations both capital and operating costs were fixed at current 1974 levels. In sections 2-4 below the sensitivity of selected IRR's to various levels of cost escalation is analyzed. In all of these analyses it is assumed that no subproject construction schedule will go beyond 1976.

Since increased rice and barley production is to result from this Project, the proper pricing of these grains is crucial to this economic analysis. Discussions with an IBRD representative developed that they are forecasting a CIF price for rice landed in Korea in 1980 of around $250 MT for polished rice of the quality type that Korea buys. It may be assumed that the additional rice production anticipated from the subprojects will substitute for imports at that price level. Since the World Bank estimates the Korean won to be overvalued by about 30% 2/ the $250 becomes $325 equivalent in won. The landed cost or rice today in Korea is very high - over $500.MT. Although it should come down by the end of the 1975 crop year, when the first significant production increases would be realized from these subprojects, it will likely average in excess of $325 equivalent per MT during the period 1975-1980. Thus the IRR runs have been made with rice at $355 equivalent per MT and barley at $229 equivalent per MT. These happen to be the current Korean domestic support prices but are believed to be realistic projections for Project economic evaluation purposes.

1/ See Annex tables 3 and 4 for breakdowns of production costs (excluding water charges) and benefits for the 88 irrigation systems.

2/ Based on an evaluation of export industry subsidies. The IBRD uses such a factor in its appraisal of import substitution projects.

Sensitivity tests were made to ascertain the effect of certain crucial variables on the IRRs of representive subprojects and in some instances collectively all 88 systems. The results of these tests indicate economic viability for this Project under the adverse conditions assumed. The results are summarized below. (Copies of the ADC's computer printouts of IRR calculations are available in AID/W for at least one sample of each of the three types of sensitivity tests where the computer was used. In the tables below those IRR figures followed by an asterick are supported by computer printout sheets which are available in ASIA/CD.)

(Continued on Page 18)

1. Effects of lower product prices

As indicated in the following table the prices of rice and barley were reduced and IRRs for the indicated subprojects were recalculated. Barley prices were reduced a greater percentage than rice because the Korean support price for barley is high in comparison with the international price. Since the estimated increase (for all 88 systems) in rice production (80,500 MT) is greater than the increase in barley production (60,000 MT), the proportionately greater reduction in barley prices does not have a proportionate adverse effect on benefits.

Subproject (system)		IRRs including land conversion equiv /MT	IRRs excluding land conversion, at indicated prices equiv /MT			
Rank order	Name	Rice @ $355 Barley @ $228 (%)	@ $355 @ $228 (%)	@ $300 @ $132 (%)	@ $250 @ $110 (%)	@ $200 @ 88 (%)
46	Sin-gog	29	32 (Est)	15(Est)	12(Est)	8(Est)
32	Na-po	43	43	20	15	9
53	San-nam	25	26	12	8	3
68	Hak-ha	22	22	13	10	6
82	Weon-san	17	18	8	5	2
	All 88	48*	51*	29	20*	10

*Copies of computer printout sheets available in ASIA/CD.

Due to a misunderstanding with the ADC personnel sensitivity runs resulting in the IRRs shown in the last three columns of the above table were made excluding land conversion costs, but as can be seen by a comparison of the first two columns of IRRs the effect on the IRRs is only siginificant in the case of the Sin-gog subproject (#46) where the cost of land conversion is a greater proportion of the total remaining capital costs. Thus the last four columns are a valid indication of product price sensitivity.

Basically the above table indicates that the subprojects are highly sensitive to product price declines and this was anticipated. Very roughly, a reduction of 15% (to $300/MT) in rice price about halves the IRRs. The rationale in the section immediately above for forecasting a $355 equivalent /MT price is believed, however, to be sound.

2. Effects of higher construction costs

The sensitivity of representative subproject IRR's to several higher construction costs (including land conversion) was also tested with the following indicated results:

Subproject (system) Rank order	name	Assumed year of completion	IRRs at indicated capital cost escalations over indicated year 1974 (at cost) (no more escalation) (%)	1974(at cost) 1975(10% over '74) 1976(10% over '75) (%)	1974(at cost + 10%) 1975(20% over '74) 1976(20% over '75) (%)
46	Sin-gog	(1976)	29	17(Est)	
28	Mae-ho	(1976)	45	n.a.	30
32	Na-po	(1975)	43	35*	
43	Dong-song	(1976)	30	n.a.	20
53	San-nam	(1975)	25	23	
68	Hag-ha	(1975)	22	20	
82	Weon-san	(1975)	17	15	
	All 88	(1976)	48	47*	39

* Copies of computer printout sheets available in ASIA/CD

This table demonstrates a significant sensitivity to capital cost escalation. Sin-gog is particularly sensitive because of the large remaining costs after 1974. For subprojects with significant proportion of expenditures in 1976 the IRRs drop by about 1/3 at the highest escalation rate tested.

3. The combined effects of higher farm input costs and higher construction costs

The following table illustrates the effect on selected IRRs of combined escalation of farm input costs and construction costs:

Subproject (system) Rank order	Name	IRRs Based On: Presently estimated 1974 costs with no further escalation	Presently estimated 1974 farm production costs with 10%, 20% and 20% construction cost escl for 1974, 1975 & 1976 respectively	1974 estimated farm production costs +50% one time escalation with 10%, 20% and 20% construction cost escalations for 1974, 1975 and 1976 respectively
46	Sin-gog	29	n.a.	14(Est)
28	Mae-ho	45	30	27
43	Dong-song	30	20	17*

* Copy of computer printout sheet available in ASIA/CD

From the last two columns of the above table it can be seen that the effect of a 50% cost escalation on all farm inputs causes only a modest decline in the IRRs. The combination of 50% higher farm input cost and escalated

construction costs makes a significant decrease in the IRRs but as can be seen the most significant element is the construction cost escalation factor.

4. Effects of higher power costs on subprojects based on pumping

Because the Sin-gog subproject involves the pumping of vast quantities of river water and some high (average of about 18 meters) secondary lifts, it and a small pumping subproject (Na-po) were selected to test the sensitivity of their IRRs to substantially higher costs of power. For all agricultural projects electric power charges currently are:

Won 71 (17.7 US cents)/Kw/month demand charge
Won 4.57 (1.14 US cents)/Kwhr energy charge

Since these rates are stated to be subsidized, and look low, the Project Committee decided to check the actual costs of delivered power and then attempt to forecast how these may rise by 1975-76 when the pumping projects will start operating.

The Korea Electric Company (KECO) reports the cost of all power sold in 1973 as won 7.263 /Kwhr (1.86 US cents). They roughly forecast that this will increase to 10.0 won/Kwhr (2.50 US cents) in 1974. With a production cost (mainly fuel cost) of won 5.875 /Kwhr (1.48 US cents) in 1973, it appears possible to the Project Committee that the total actual cost of power sold to pumping subprojects could be as high as 15-20 won/Kwhr (3.8 -4.0 US cents) by 1975-76. This would be 3 to 4 times the current rate for irrigation or agricultural purposes.

Such "an economic rate" for power (say 4 times) would merely raise the total operation and maintenance cost for the additional Sin-gog hectarage from about W200 million to approx. W300 million and thus merely add W100 million to a W400 million recurring cost stream vs. a W1,660 million incremental benefit stream. Thus, the sensitivity of the IRR for Sin-gog to "an economic" power rate (assumed to be four times the present actual rate) appears nominal.

As in the Sin-gog subproject the pumping costs for the Na-po subproject are approximately the same proportion (15%) to the overall O&M costs. The resultant cost increase due to the same assumed economic cost for power is W5,700,000. Adding this to a W28.6 million recurring cost stream vs. an incremental benefit stream of W125.8 million can be seen to have only a nominal inpact on an IRR calculated at 35.3%.

B. Financial Return on Total Project Costs and Cost/Benefits

Based on total Project costs financial rates of return calculations for the 66 subprojects (with rice at the internal support price of $355 equivalent per MT and barley at $228 equivalent per MT) show a range from 77% to 10% - see column(4), table 1 of the Annex. It can therefore be deduced that on a strictly benefit cost ratio basis all of these subprojects exceed by a substantial margin a one to one ratio. Thus the requirements of FAA of Section 611(b) and App. Section 101 relating to the Memorandum of the President dated May 15, 1962, and pertaining to cost/benefit ratios have been met.

Since the capital costs of each of these systems is 70% subsidized to the FLIAs by the ROKG it follows that the farmers will benefit not only at these relatively attractive Financial Rates of Return but also to the extent of this Government subsidy.

Based on the figures for all 88 systems (which would not be very different from the comparable figures for the 66 subprojects selected since the latter group contains the one very large project, Sin-gog) the average farmer in the project area would realize net benefits of approximately won 165,000 ($412) per annum. This is derived from the estimated "net profit" for all farmers shown as won 19,526,510,000 in table 4 of the Annex divided by the 103,413 farmers in the 88 systems minus an estimated water charge averaging won 25,000 ($62.50) per farm. The water charge includes debt service on 30% of the project capital costs and covers all other expenses of delivering the water to the farmer including system maintenance costs. Thus the capacity of the farmer to pay water charges of $62.50 after a return of $475 per annum is obvious. We understand that the farmers pay their water charge assessments either in cash or kind after the harvest and only on the basis of some catastrophe are water charges either reduced or eliminated for an irrigation season.

V. Environmental Impact

The possible harmful environment aspect of this Project is the likely slightly higher health hazard of water-related diseases (including encephalitis and malaria both with mosquitos as the vector), while on the positive side there should be a lessening of silt flow and flooding.

When considering the possible environmental problems, it is necessary to view the current situation and the changes that will be made. The conversion of forests and upland crop areas to irrigated paddy will, of course, increase the shallow water areas conducive to mosquito breeding. However, the fact that the bulk of the land is already in paddy and will remain in paddy minimizes the local change. The addition of irrigation water on lands that are wet most of the time from accumulated rain will not greatly increase the mosquito problem. The inclusion of drainage in many of the project units would tend toward a reduction of the mosquito problem at certain times of the year, but the net effect would be minor because of the overwhelming balance of wet lands -- on an overall area and time basis.

Beyond the local effect of change, this overall irrigation plan should be viewed as a part of the total situation in Korea. Each subproject is relatively small within its locality and the total program is an even smaller part of the national total. The full 88 systems proposal includes a total of about 18,000 hectares of land to be converted to paddy in contrast with 1,275,000 hectares of paddy in Korea in 1971. Thus, Korea's paddy lands would be increased by only 1.4 percent by the total 88 systems.

Most of the reservoirs in this program have relatively steep banks, thus affording very little shallow water for mosquito breeding. Furthermore, the changes of reservoir level during the filling and use periods of the summer should reduce even that minor area which is conducive to mosquito reproduction.

The foregoing discussion cannot be quantified; however, it seems likely that the mosquito breeding opportunity in Korea would be increased by considerably less than two percent.

Most paddy fields can be managed to reduce the mosquito breeding by drying the surface of the land for a day or two without damage to the crop. This would kill the mosquito larvae. However, it appears highly unlikely that the farmers would participate in such a program over a wide enough geographic area to have a worthwhile impact. With irrigation water available, a farmer might be more receptive to draining his fields periodically than would the farmer who must depend upon the water that he can retain in his rain-fed paddy. If a mosquito control program were to be attempted, it would have to be on a much more comprehensive basis than these project areas in order for it to do any good at all.

It is understood that malaria is not present except in some localities of the extreme south coast, and is not considered to be a significant problem there. Much of Korea is too high and cold for this disease. Encephalitis is somewhat more common.

Water conveniently available in irrigation ditches often becomes a domestic water source in rural areas with obvious health hazards. Such small surface water sources are common conveyors of any water-borne disease including those of the gastro-entro tract. The latter class of disease is probably endemic to most of the area involved and its prevention is partly a matter of the development of a safe potable water supply. A side, minor observation on this is that it is interesting to find at least some farmers now use water purification tablets in their "ditch-water" for home use. It is doubtful that the irrigation ditch will present a significantly greater risk than the presently used sources.

Beyond the possible health hazards, there are other environmental aspects. The conversion of "forests" (mainly scrub waste lands) and upland to paddy has a beneficial result on reducing the sediment ("silt") transported to the streams and downstream areas. The paddies and reservoirs all retain water and thus help to decrease the downstream flooding. A number of the subprojects include drainage for agricultural benefit, and this also tends to reduce the environmental problems of flooding. These environmental benefits have not been claimed in the economic analyses and probably outweigh the possible minor overall increase in the incidence of water-related diseases.

VI. Impact on People

The Project will benefit about 95,000 farm households, approximately 560,000 individuals. This represents about 4 percent of the total farm population of Korea. Individual farm household net annual incomes after project completion will be increased on the average of about won165,000, ($412) or 125 percent of present income from their lands.

While all Korean farms are small, with farms averaging only 0.92 hectares, and virtually all Korean farmers are poor, with average incomes in 1972 of $180 per capita, the farms within the project area are likely below this per capita average since they now have rain-fed paddy fields while the majority of the paddy lands nationwide suitable for irrigation are fully irrigated. As mentioned in Section I A of this paper rural income growth has been lagging far behind urban income growth for the past ten years. Even if the Project farm families are up to the $180 per capita level, the Project would add $70 per capita of net income for a new total of $250 which would bring their incomes only up to the national average for 1972. Thus this activity will provide long-term benefits to a substantial number of the poorer people in Korea.

Since construction methods on these subprojects are relatively labor intensive, with unskilled labor costs constituting approximately 30 percent of total project cost compared with only 3 percent for unskilled labor costs under the highly intensive machine methods utilized by the UNDP Upland and Watershed Management Project in Korea, this project will have a favorable short term impact on rural income. In terms of employment of rural people, approximately 13 million man days of employment will be provided during the period of project construction. In addition rural people will be employed during the off-season for the maintenance of the irrigation systems. Thus there will be a large immediate and lesser, continuing supplement to rural income in the subproject areas from these activities.

VII. Prospects for Repayment

A. Korea's Balance of Payments Position and Debt Service Capacity

In July 1973 the ROKG made public its revised economic projections for the period 1973-1981, which are based on achieving the ambitious targets of $10 billion in exports and $1,000 per capita GNP by 1981. Real GNP is expected to increase by 9% per annum in 1974-76, and by 11% per annum from 1977 through 1981. Manufacturing will grow most rapidly in investment and output, with heavy industry increasing from 35% to 51% of manufacturing output, and from 27% to 65% of manufactured exports during the period. Compared to an overall annual growth of 16% to 17% for manufacturing, agricultural output is projected to increase at about 4% to 5% annually.

These projected growth rates will, of course, have a significant impact on the country's Balance-of-Payments. Commodity exports are expected to grow in real terms at a compound rate of 28% through 1976, but will slow to 16% in 1977-81. Imports are expected to increase by 14.4%, through 1976, and 12.6% in 1977-81. Thus, Korea's net goods and services deficit is expected to remain in the $650-800 million range through 1978, decline to $260 million in 1980, and change to a $90 million surplus in 1981.

Total foreign savings required (1973-1981)are estimated to be $5.05 billion, and gross foreign capital arrivals are estimated at $10.0 billion composed of $1.6 billion in foreign investment, $4.1 billion in public loans and $4.3 billion in commercial loans. Little decline is forecast in gross capital inflows through 1981, when arrivals will equal outflows of $1.1 billion in debt service and profit remittances. Debt outstanding, however, is expected to increase less rapidly than exports, and the debt service ratio (for debt of three years and over) was estimated to decline from 14.4% to 7.6% of goods and services exports, 1972-1981. Table VII-1 presents a summary of Korea's Balance-of-Payments forecast for 1973-81 as included in the Long-Term Plan announced in July 1973.

Table VII-1

Balance of Payments Forecast in ROKG Long-Term Plan
(in current prices)1/

in million U.S. dollars

	ACTUAL 1972	1973	1976	1981	1972-76	1977-81
I. Goods and Services	-520	-835	-660	90	-3,442	-2,147
1. Merchandise Exports	1,676	2,350	4,407	10,970	14,985	39,375
2. Merchandise Imports	2,254	3,104	4,798	10,289	17,695	39,111
Trade Balance	-578	-754	-391	681	-2,710	264
3. Invisible Receipts	565	599	852	1,628	3,398	6,528
4. Invisible Payments	507	680	1,121	2,219	4,110	8,939
Invisible Balance	58	-81	-269	-591	-712	-2,411
II. Transfer Payments (Net)	170	148	154	76	799	429
Current Account Balance	-350	-687	-506	166	-2,643	-1,718
III. Capital Transactions (Net)	489	789	638	369	3,265	3,209
5. Long-term Capital (Gross)	718	981	1,020	1,126	4,713	6,037
6. Amortization	-202	-242	-321	-498	-1,330	-2,080
7. Short-term Capital & Others (Net)	53	50	-61	-259	-98	-748
IV. Changes in Foreign Exchange Holdings	159	102	381 2/	149 3/	642	1,491
V. Foreign Exchange Holdings	694	796	1,177	2,668	4,620	9,501

1/ Assuming 3.5% dollar inflation beginning in 1973.
2/ Cumulative, 1974-76
3/ " , 1977-81

Source: ROKG Forecasts for 1973-81 (announced July, 1973)

Since the announcement of the Long-Term Plan for 1981, the oil crisis and accelerated world inflation have somewhat altered the outlook, though the ROKG has not formally changed its strategy or forecasts. All magnitudes in the original plan will obviously be increased by inflation. The ROKG has tentatively estimated that $14-15 billion in gross foreign capital inflows, rather than $10 billion, will now be required. Although export earnings in current prices will also increase faster than expected, the estimated effect on the debt-service ratio for long-term debt in 1981 will be to increase it by 2-4%, i.e., to about 10-12% or roughly the ratio prevailing in 1973-74. Table VII-2 shows that Korea's total debt-service ratio has dropped sharply since 1971, to an estimated 12.3% in 1974. Service on medium-term (1-3 year) debt is now a much smaller part of total service, and Korea's improved debt-service position has enabled it to secure bank loans of up to 10 years to replace, in part, short and medium-term bank borrowing.

Table VII-2 also indicates that Korean export earnings in 1973 greatly exceeded the original estimate shown in Table VII-1 and that export earnings in 1974 will probably approximate the previous estimate for 1976, largely due to accelerated world inflation. Due mainly to a $770 million increase in its oil import bill, Korea's goods and services deficit is expected to increase from $602 million to $1.24 billion in 1974. However, sufficient foreign financing is expected to be available to permit a further increase in foreign exchange holdings, from $1.03 billion at the end of 1973 to an estimated $1.14 billion at the end of 1974. No comparable forecasts are available beyond 1974.

B. Specific Arrangements for Repayment of Loan

Repayment of this loan will be a charge against ROKG general resources. From section A above it can be seen that the Korean economy should have no problem with undertaking this additional foreign exchange debt servicing burden. USAID further believes that ROKG revenues will be sufficient to provide budgetary resources for servicing of this proposed debt.

Table VII-2

Debt Service Payments and Ratios
(millions of dollars)

	A1971	A1972	P1973	E1974
A. Foreign Exchange Earnings	1,616	2,226	4,088	5,387
1. Commodity Exports	1,132	1,676	3,212	4,468
2. Service Earnings	484	550	876	919
B. Principal Repayments	232	272	404	378
C. Interest Payments	89	126	169	267
D. Total Debt Service	321	398	573	665
E. (Of which 1-3 year debt)1/	(106)	(83)	(159)	(105)
F. Debt Service Ratio (D/A x 100)	19.9	17.9	14.0	12.3

1/ Including some bank loans of term longer than 3 years.

Source: ROKG data and estimates as compiled by USAID/Seoul; no comparable forecasts currently available beyond 1974.

VIII. Implementation

A. Reimbursement

Since two objectives of undertaking this Project are (1) to assist the ROKG in the early completion of high pay-off irrigation systems, some of which have been worked on for some time, and (2) to assure adequate advance funding by the ROKG for the construction of these systems, the mechanism of reimbursement only after subproject completion was decided by the Project Committee to be the incentive needed. As indicated previously reimbursement would be 75% of the costs incurred and paid after 1/1/74 for completion of each eligible subproject. On the average, the 75% is not expected to exceed the total direct costs paid to contractors, and paid for material supplies and direct engineering and supervision. The remaining 25% for which the ROKG will not be reimbursed may be considered as covering ADC other direct project charges, land acquisition, and all remaining costs.

In addition as a measure to assure adequate budgeting on the part of ADC for the eligible subprojects so that enough of these would be started and completed to maximize the early increase in grain production, an advance partial funding arrangement has been worked out with the ROKG. This arrangement is spelled out in section D below. The advance in the form of an up to $5 million Special Letter of Credit will be made upon request after the relevant Condition Precedent to disbursement has been satisfied. Thereafter as eligible subprojects are completed new or amended Special Letters of Credit will be issued to cover the amount(s) "earned" by the completion(s). The first such completions could come shortly after the advance and be followed by more in the fall of 1974. A substantial number of completions are estimated to occur in 1974 and 1975.

The Project Committee has developed the outline on the following page of the type of information required to document a request for reimbursement. In discussions with ROKG representatives they indicated that the required information would be readily available to them to facilitate preparation of this documentation. A format is to be developed with the ROKG and incorporated in an Implementation Letter which will establish precisely the information to be submitted including adjustments to be made in the reimbursements to compensate for the advance.

Documentation Required for Reimbursement

Upon completion of a subproject the ADC will submit through EPB to USAID a request for reimbursement of 75% of the actual costs to complete the subproject as itemized in item (3) below supported by the following evidence in form and substance satisfactory to AID:

(1) A certification by ADC that the subproject has been completed in accordance with ADC approved plans and specifications.

(2) An endorsement by the concerned FLIA on the above certification.

(3) A statement of payments made year by year for subproject costs incurred from 1/1/74 and itemized as follows:

(a) Total payments to contractor for work accomplished from 1/1/74.

(b) Total cost of materials and equipment (excluding reparations supplied items) charged to and incorporated in subproject from 1/1/74.

(c) Construction supervision and design modification work (if any) done.

(d) Any other direct charge of ADC on items (a) and (b) above

(e) Land acquisition costs (right-of-way), if any, incurred from 1/1/74.

The Special Letter(s) of Credit(SLC) would be drawn down by Korean imports of U.S. goods and services and against invoices and bills of lading evidencing such imports.

B. Actual Cost Reimbursement

Very early in USAID's consideration of support for these irrigation activities, it was decided that a reimbursement procedure was highly appropriate in Korea for financing local currency costs, and USAID advised the ROKG that any AID assistance for these irrigation activities would be based on a reimbursement concept.

Subsequently, based on experience in the Philippines, AID/W suggested the use of a fixed cost type of reimbursement procedure under which 75% of the estimated cost of completion of each subproject would be established beforehand as the amount to be reimbursed upon completion regardless of actual cost. Based on a review of the "Statement of John E. Milgate, Associate Director, International Division (of United States General Accounting Office) on the Use of the Fixed Cost Reimbursement Method for Dispensing United States Economic Assistance Abroad," USAID believes that most of the benefits cited in this statement stem mainly from the reimbursement feature rather than the fixed cost feature and that an actual cost basis is more appropriate in the instant case where a number of individually engineered subprojects will be completed over a period of time. Reimbursement against actual expenditures will be administratively much simpler in many respects but especially in that it will automatically adjust for legitimate escalated costs in each of the future years that subprojects will be completed.

In practice, the procedure which will be used does include important characteristics of a fixed cost system. Maximum unit costs of various elements of work (e.g. per cubic yard of earth moved, concrete in place, manhours of other labor used etc.) are fixed annually by the ROKG. These costs apply not only to ADC contracted work but government-wide and cannot be exceeded in contracts for project work. Thus the principal variables are amounts of work done and these can be readily inspected and controlled.

Since each of these 66 subprojects is unique in its design, all are under construction and are at various stages of completion, the task would be monumental to independently verify the estimated costs for completing all of them. After reviewing this situation with the ADC the Project Committee Irrigation Engineer concluded that ADC is doing a competent job of cost estimating for these subprojects on a current year basis and that such costs are estimated within plus or minus ten percent. Since AID does have ADC's 1974 estimates of the cost based upon current prices to complete each subproject, these can be used as benchmarks for testing actual costs prior to reimbursement. These 1974 cost estimates are backed up in ADC's records by breakdowns of the remaining cost elements and are readily accessible to USAID. As indicated in a subsequent section entitled Monitoring AID will retain the right of detailed post audit of these subprojects, and plans on a random sample basis to do so.

The Project Committee has reviewed the planning, record keeping and control procedures to be employed on this work and has also observed the results of past performance. These give confidence that ADC and the concerned FLIA's have strong qualifications for the control of costs and any additional motivation which might be provided by a total fixed cost procedure is not necessary to hold expenditures down.

After careful consideration of the pros and cons of the two alternatives, (fixed cost vs. actual cost) as discussed above, it has been decided that on balance actual cost reimbursement is the most appropriate and feasible method under this loan.

C. Planned Advance

The AID loan will enable the ROKG to complete sub-projects - particularly those with higher incremental economic rates of return - as fast as possible. In this way, Korea will receive benefits sooner from completed subprojects, AID funds will flow more quickly. Since under the reimbursement procedure, AID funds cannot be disbursed until work is budgeted for and completed, we hoped that the budgetary availability in 1974 for the 66 subprojects would be substantially greater than the approximately ₩3.2 billion which has been budgeted. Moreover, the actual work which can be accomplished within the budget limit is substantially reduced because of recent cost increases.

In view of the above and to provide incentives for the ROKG to substantially increase the amount of work done this year toward completing subprojects with higher rates of return, USAID made the following proposal

to the ROKG: If the ROKG will plan to do an additional ₩2.0 to 4.0 billion work in 1974 concentrated on completing higher rate of return subprojects among the 66, AID would, upon receiving firm evidence of that plan, provide an advance of up to W2.0 billion equivalent ($5.0 million) against future reimbursements. Evidence of the plan would probably consist of an approved supplemental budget demonstrating the amount of the increase and a work plan demonstrating suitable concentration on completing higher rate of return subprojects. Later as subprojects are completed and reimbursement asked for, 50% of the amount which otherwise would have been reimbursed would be credited as a reduction in the advanced amount and 50% would be actually reimbursed. This would continue until the value of the advance was complete offset.

In response to the above proposal the Deputy Prime Minister submitted on 5/7/74 a request to AID for a $17.2 million loan and in the same letter stated that "We plan to provide the 66 systems with an additional budget of about 2,845 million won within this year through the Supplemental Budget." Thus a total ROKG budget in 1974 of 6.1 billion ($15.2 million) would be available to finance a portion of the 66 subprojects to completion.

D. Monitoring

Chapter II has delineated the structure and capabilities of the organizations responsible for carrying out and subsequently operating and maintaining the subprojects to be partially financed by this loan. These organizations, most particularly the directly involved ADC and FLIA's, have jointly proven themselves completely capable of carrying out the work in a most satisfactory manner. There is ample evidence in both completed and partially finished projects of their ability to plan, design, build and operate such works and of their determination to produce high quality work, all without outside supervision or pressure. The ADC project staffs are supplemented by inspectors and engineers assigned to each subproject by the concerned FLIA's who, as the owners, have primary interest in getting a well and economically constructed project. For this reason, as shown in VIII-A above, the documentation required for reimbursement includes an endorsement by the FLIA of the ADC certification of completion in accordance with ADC approved plans and specifications.

Utilizing the existing comprehensive internal reporting system project progress reporting arrangements are being worked out with the ADC and MAF. These reports will serve to keep USAID will informed of subproject progress and of the manner in which costs and cash flow are developing.

Prior to responding favorably to a request for reimbursement on each subproject, a gross check will be made by USAID against the original cost estimate. Assuming any differences are explainable by USAID's experience with cost escalation during the intervening period, the required documents are in order, and no significant adverse information on the subproject is known by USAID, reimbursement would be made. As provided by the standard loan agreement provision AID will retain the right to audit ADC's accounts to verify its billings. This is planned to take place on a randon sample basis in addition to any subproject where it is indicated.

Thus, AID monitoring will assure that AID's interests and requirements are being adequately taken care of.

In addition to the above reviews AID monitoring will be carried out primarily by USAID engineers and to a limited extent by other concerned USAID personnel through review of reports supplemented by site visits, on a random sampling basis, to spot check subprojects for construction quality, progress and completions.

If contrary to expectation, unsatisfactory work should be observed, this will be brought to the attention of ADC for correction and the USAID has full confidence that suitable, expeditious action would be taken in such a case.

E. Evaluation

This project is wellsuited to a "before" and "after" evaluation survey at least on a sample bais.

Since some of the 66 subprojects will be completed during the current construction season these would not be candidates for evaluation unless adequate "before" data already exists. Among the remaining subprojects a random sample of subprojects based on (a) geographic/climatic distribution, (b) pump vs. gravity water supply, and (c) medium vs. small size could be developed.

The sample surveys would attempt to measure farm income without the project and then the second and third years after project completion to see if the projected output and financial returns materialized. The data could also be used to calculate economic returns. If there are significant differences between the original forecasts and results an attempt would be made to determine the reason.

The MAF and ADC have stated that they are willing to collect baseline and followup data for evaluation of three or four sample projects.

F. Implementation Plan

Loan Authorization	May 1974
Loan Signature	June 1974
Baseline evaluation studies	July-September 1974
CP's met for Advance	July 1974
First SLC issued	July 1974
Reimbursements for completed subprojects through SLC issuances or increases	August 1974-December 1975
Followup evaluation studies	Summers 1976 and 1977

IX. Conditions and Covenants

The only special condition precedent to disbursement envisioned for this loan relates to the planned advance of $5.0 million. This is discussed in Section VIII-C Planned Advance.

No special covenants are planned.

Table 1

Subprojects Proposed for AID Financing and Balance of Systems

(A) Name of Subproject	(B) Incremental Economic IRR(%)	(C) Rank Order Based on IRR	(D) Type of Irrigation System	(E) Benefitted Area (hectares)	(F) Total Construction Cost (Millions of Won)	(G) Remaining Construction Cost (Millions of Won)	(H) Financial Rate of Return Based on Total Cost (%)
Ha-gi	123	1	Irrigation & drainage st.	553	240	110	56
Yoon-nae	121	2	Drainage st.	650	181	136	77
Chang-woon	117	3	Drainage st.	1,832	438	309	67
Seong-su	114	4	Drainage st.	631	202	141	66
Cheol-woon	86	58	Reservoir	2,902	1,182	615	41
Chang-dong	85	6	Weir	262	345	263	58
Pung-gang	75	7	Pumping st.	1,800	1,135	511	32
Go-deok	75	8	Reservoir	305	171	88	35
Cho-gye	74	9	Pumping st.	1,140	772	294	26
Sin-gog	29 a/	46	Pumping st.	5,960 a/	5,363	4,215	47
Jang-yoo	69	11	Pumping st.	1,377	1,059	388	24
Neung-seo	67	12	Pumping st.	2,026	965	469	32
Jeoung-eup	64	13	Feeding canal	2,823	1,018	888	51
Myung-kwan	63	14	Reservoir	268	233	106	26
Pung-yang	63	15	Pumping st.	1,669	1,113	728	36
Im-jin	61	16	Pumping st.	760	351	221	35
Yang-seo	60	17	Pumping st.	2,937	1,851	1,211	34
Jang-ha	58	18	Pumping st.	231	106	73	37
Se-do	56	19	Pumping st.	317	225	99	24
Cheong-yong	54	20	Reservoir	277	183	111	30

a/ After the table was typed final the calculation of incremental benefits were determined to be based upon the original total of 15,926 hectares instead of the remaining 5,960 hectares. Recalculation of the incremental economic IRR reduced it to 29%. The rank order for this subproject now becomes 46 and all other subproject numbers between 47 and 9 adjust accordingly.

Table 1

Subprojects Proposed for AID Financing and Balance of Systems

Name of Subproject	Incremental Economic IRR(%)	Rank Order Based on IRR	Type of Irrigation System	Benefitted Area (hectares)	Total Construction Cost (Millions of Won)	Remaining Construction Cost (Millions of Won)	Financial Rate of Return Based on Total Cost (%)
Gun-am	52	21	Pumping st.	288	217	106	23
Jeong-an	49	22	Reservoir	257	232	99	20
Cho-jeon	48	23	Reservoir	334	307	177	25
Man-kyung-gang	48	24	Weir	2,099	1,330	1,176	39
Expansion of Keum-dong	47	25	Pumping st.	883	525	298	26
Do-gap	46	26	Reservoir	147	159	74	21
O-ryu	46	27	Reservoir	150	152	82	23
Mae-ho	45	28	Pumping st.	546	423	259	26
Yi-bug	44	29	Drainage st.	364	308	210	28
Ku-man	44	30	Reservoir	516	422	249	24
Gi-gye	44	31	Reservoir	276	260	183	30
Na-po	43	32	Pumping st.	449	461	224	19
An-deok	41	33	Reservoir	201	186	113	24
Yang-hwa	40	34	Reservoir	213	268	136	19
Hwa-chon	37	35	Reservoir	200	195	96	18
Ma-dun	37	36	Reservoir	500	391	242	22
Do-bong	36	37	Reservoir	78	72	48	22
Ha-nam	36	38	Irrigation & drainage st.	818	692	536	26
Dong-cheon	35	39	Infiltration gallery	592	438	396	30
Yong-un	33	40	Reservoir	169	225	128	18

Table 1

Subprojects Proposed for AID Financing and Balance of Systems

(A) Name of Subproject	(B) Incremental Economic IRR(%)	(C) Rank Order Based on IRR	(D) Type of Irrigation System	(E) Benefitted Area (hectares)	(F) Total Construction Cost (Millions of Won)	(G) Remaining Construction Cost (Millions of Won)	(H) Financial Rate of Return Based on Total Cost (%)
Ma-jin	32	41	Pumping st.	156	199	124	20
Gae-wun	30	42	Reservoir	115	215	77	11
Dong-song	30	43	Reservoir	802	984	805	24
Jeom-gog	30	44	Reservoir	140	172	113	19
Saeing-lim	29	45	Drainage st.	323	328	176	14
Do-cho	29	46	Irrigation & drainage st.	343	331	273	22
Ko-pung	28	47	Reservoir	1,457	1,657	1,010	16
Ji-san	28	48	Reservoir	408	1,088	661	15
Geo-jin	27	49	Reservoir	300	310	234	20
Yi-dong	26	50	Reservoir	2,160	1,483	1,473	26
Keum-sa	26	51	Reservoir	288	306	259	21
Seong-yeon	25	52	Reservoir	300	320	226	17
San-nam	25	53	Pumping st.	320	417	301	17
Jeong-bug	25	54	Reservoir	189	242	195	20
O-weon 1/	15	85	Reservoir	100	274	237	13
Yeo-ju	25	56	Pumping st.	180	120	117	27
Da-jeong	24	57	Reservoir	86	125	90	17
Hwang-dun	24	58	Reservoir	122	222	90	10
Song-weol	24	59	Reservoir	70	90	74	19
Gong-seong	24	60	Reservoir	1,000	1,160	1,044	21

1/ The calculation of this subproject's economic IRR was erroneously done and discovered after this table was typed final. This "system" therefore (- 3 -) moves down to IRR rank order No. 85. Thus the above IRR rank order numbers 51 thru 85 should in turn move upward by one rank order.

Table 1

Subprojects Proposed for AID Financing and Balance of Systems

Name of Subproject (or system)	Incremental Economic IRR(%)	Rank Order Based on IRR	Type of Irrigation System	Benefitted Area (hectares)	Total Construction Cost (Millions of Won)	Remaining Construction Cost (Millions of Won)	Financial Rate of Return Based on Total Cost (%)
Gyo-dong	24	61	Pumping st.	600	520	455	20
Mang-deok	23	62	Pumping st.	320	458	326	15
Cho-dae	23	63	Reservoir	200	243	177	16
Ga-jo	23	64	Reservoir	1,166	1,412	1,338	21
Go-yeon	22	65	Reservoir	368	599	408	14
Goong-pyung	22	66	Pumping st.	210	185	153	18
Subtotal 2/				49,533	37,738	26,135	
In-deok	22	67	Reservoir	110	156	128	17
Hak-ha	22	68	Reservoir	537	617	458	15
Dae-Ryong	21	69	Reservoir	420	574	477	17
Baek-sook	21	70	Reservoir	180	216	154	15
Wun-gog	21	71	Reservoir	320	357	271	15
Song-nae	20	72	Reservoir	180	301	229	15
Seo-ma	20	73	Reservoir	109	144	115	16
Do-cheok	20	74	Reservoir	192	247	164	13
Baek-gog	20	75	Irrigation & drainage st.	275	350	320	18
Seong-san	20	76	Reservoir	140	201	176	17
Eun-cheok	20	77	Reservoir	134	183	171	19
Hwa-bug	19	78	Reservoir	180	300	241	15
Sang-song	18	79	Reservoir	80	128	113	15
Weol-soong	18	80	Pumping st.	460	867	711	14

2/ Subtotal revised to reflect results of changes caused by footnotes a/ and 1/.

Table 1

Subprojects Proposed for AID Financing and Balance of Systems

Name of System	Incremental Economic IRR(%)	Rank Order Based on IRR	Type of Irrigation System	Benefitted Area (hectares)	Total Construction Cost (Millions of Won)	Remaining Construction Cost (Millions of Won)	Financial Rate of Return Based on Total Cost (%)
Chang-su	17	81	Reservoir	199	416	322	13
Weon-san	17	82	Reservoir	100	185	154	14
Yong-am	17	83	Drainage st.	45	69	68	16
U-gang	15	84	Pumping st.	367	811	623	11
Bul-mo-san	15	85	Reservoir	220	423	366	13
Dong-yi	13	86	Reservoir	780	1,277	1,076	11
Ga-san	13	87	Reservoir	116	234	228	13
Deak-san	12	88	Reservoir	445	1,026	894	11
Subtotal:2/				5,579	9,200	7,568	..
GrandTotal:				55,112 3/	46,938	33,703	

2/ Subtotal revised to reflect results of changes caused by footnote 1/

3/ 9,966 hectares of lands in the Sin-gog subproject already irrigated will receive additional water as a result of this Project. This hectarage is not however included in this total.

TABLE 2 - PROJECT CROSS REFERENCE

RANK ORDER based on IRR (Col.(G) Table 1)	Sub-Project (System) Name	Location Map Reference Province	No.
1	Ha-gi	Gyeong-Nam	9
2	Yun-nae	" "	10
3	Chang-weon	" "	6
4	Seong-su	Gyeong-Buk	4
5	Cheol-weon	Gang-Won	1
6	Dae-cheon	Chung-Nam	4
7	Pung-gang	Gyeong-Buk	12
8	Go-deog	Jun-Buk	1
9	Cho-gye	Gyeong-Nam	14
(Revised #46)	Sin-gog	Kyeong-Gi	5
11	Jang-yu	Gyeong-Nam	17
12	Neung-seo	Kyeong-Gi	9
13	Jeong-eup	Jun-Buk	4
14	Myeong-gwan	Gyeong-Nam	1
15	Pung-yang	Gyeong-Buk	13
16	Im-jin	Keyong-Gi	3
17	Yang-seo	Gyeong-Buk	11
18	Jang-ha	Chung-Nam	1
19	Se-do	Chung-Nam	9
20	Cheong-yong	Kyeong-Gi	1
21	Gun-am	Keyong-Gi	8
22	Jeong-an	Chung-Nam	2
23	Cho-jeon	Gyeong-Buk	15
24	Man-gyeong-gang	Jun-Buk	6
25	Exp.Keum-dong	Chung-Buk	1
26	Do-gab	Jun-Nam	3
27	O-yu	Jun-Nam	13
28	Mae-ho	Gyeong-Buk	1
29	E-buk	Gyeong-Nam	20
30	Gu-man	Jun-Nam	10
31	Gi-gye	Gyeong-Buk	5
32	Na-po	Jun-Buk	3
33	An-deog	" "	2
34	Yang-hwa	Gyeong-Nam	4
35	Hwa-chon	Gang-Won	2

36	Ma-dun	Kyeong-Gi	12
37	Do-bong	Jun-Buk	5
38	Ha-nam	Gyeong-Nam	2
39	Dong-cheon	" "	18
40	Yeong-am	Chung-Nam	4
41	Ma-jin	Geyong-Nam	8
42	Gae-wun	Gang-Won	3
43	Dong-song	Gang-Won	6
44	Jeom-gog	Gyeong-Buk	6
45	Saeng-rim	Gyeong-Nam	3
46	Do-cho	Jun-Nam	11
47	Go-pung	Chung-Nam	3
48	Ji-san	Jun-Nam	2
49	Geo-jin	Gang-Won	5
50	Ie-dong	Kyeong-Gi	4
51	Keum-sa	Jun-Nam	7
52	Seong-yeon	Chung-Nam	7
53	San-nam	Gyeong-Buk	18
54	Jung-bug	Gyeong-Nam	7
55	O-weon	Gang-Won	7
56	Yeo-ju	Kyeong-Gi	11
57	Da-jeong	Gyeong-Nam	16
58	Hwang-dun	Gang-Won	4
59	Song-weol	Jun-Nam	8
60	Gong-seong	Gyeong-Buk	8
61	Gyo-dong	Kyeong-Gi	2
62	Mang-deog	Jun-Nam	6
63	Cho-dae	Chung-Nam	6
64	Ga-jo	Gyeong-Nam	19
65	Go-yeon	Gyeong-Nam	11
66	Gung-pyeong	Kyeong-Gi	10
67	Hae-pyeong	Gyeong-Buk	16
68	Hag-ha	Chung-Nam	5
69	Dae-yong	Jun-Nam	1
70	Baeg-seog	Kyeong-Gi	7

71	Un-gog	Chung-Nam	8
72	Song-nae	Gyeong-Buk	7
73	Seo-ma	Jung-Buk	7
74	Do-cheog	Kyeong-Gi	6
75	Baeg-gog	Gyeong-Nam	15
76	Seong-san	Jun-Nam	9
77	Eun-Cheog	Gyeong-Buk	9
78	Hwa-buk	" "	14
79	Sang-song	Jun-Nam	12
80	Weol-seong	Gyeong-Buk	2
81	Chang-su	Gyeong-Buk	3
82	Weon-sam	Gyeong-Nam	12
83	Yong-am	Gyeong-Buk	17
84	U-gang	Gyeong-Nam	5
85	Bul-mo-san	Gyeong-Nam	13
86	Dong-ie	Chung-Buk	2
87	Ga-san	Gyeong-Buk	10
88	Deok-san	Jun-Nam	5

TABLE 3

Gross and Net Income per Hectare before and after the Project

(Figures are for 88 Systems)

Item	Before project Implementation							After Project Implementation		
	Rice	Barley	Naked barley	Soy bean	Sweet potato	Chinese cabbage	Red pepper	Rice	Barley	Naked barley
1. Gross Income	366,755	193,317	243,141	111,904	512,058	297,696	376,480	586,617	212,646	267,454
Main product value	333,413	177,355	223,065	102,664	497,144	297,696	372,752	533,288	195,090	245,372
Yield(kg)	2,712	1,940	2,440	800	16,950	13,290	630	3,750	2,134	2,684
Price per MT (won)	142,210	91,420	91,420	128,330	29,330	2,240	591,670	142,210	9,420	91,420
By-product value	33,342	15,962	20,076	9,240	14,914		3,728	53,329	17,556	22,082
2. Production cost										
Seed								4,430	4,790	5,176
Inorganic chemicals								12,071	11,727	14,134
Organic chemicals								9,074	10,500	12,735
Spraying Materials								8,277	2,250	2,250
Farm machinery								1,953	608	1,033
Farm house								11,246	9,216	10,000
Farm animal								2,444	2,477	2,775
Sub Total	53,658	40,000	36,716	15,910	53,908	58,424	89,040	59,290	46,352	53,898

TABLE 3 CONTINUED Gross and Net Income per Hectare before and after the Project

Item	Before project Implementation							After Project Implementation		
	Rice	Barley	Naked barley	Soy bean	Sweet potato	Chinese cabbage	Red pepper	Rice	Barley	Naked barley
Sub Total (previous)	53,658	40,000	46,716	1,591	53,908	58,424	89,040	59,290	46,352	53,855
Hired labor	28,020	10,783	10,783	9,141	15,074	18,033	42,060	29,421	11,322	11,322
Sub Total	81,678	50,783	57,499	10,732	68,982	76,457	131,100	88,711	57,674	65,177
Family labor	70,520	54,223	54,223	57,671	75,466	79,715	120,517	77,572	59,645	59,645
Grand Total	152,198	105,006	111,722	68,403	144,448	156,172	251,617	166,283	117,319	124,825
3. Net Income	214,557	88,311	131,419	43,501	367,610	141,524	124,863	420,334	95,329	42,609

Estimated Net Profit** after Project Implementation
(Figures are for 83 Systems)

Crop	Before Implementation: Planting Area (ha)	Gross Income: Per Hectare Won	Gross Income: Total Thousand Won	Production Cost: Per Hectare Won	Production Cost: Total Thousand Won	Net Profit	After Implementation: Planting Area (ha)	Gross Income: Per Hectare Won	Gross Income: Total Thousand Won	Production Cost**: Per Hectare Won	Production Cost**: Total Thousand Won	Net Profit**	Increased Gross Income (1,000 Won)	Increased Product Cost** (1,000 Won)	Balance** (1,000 Won)
Rice	48,220	366,755	17,684,926	152,198	7,338,963	10,345,938	65,874	536,617	38,642,808	166,283	10,953,726	27,689,082	20,957,882	3,614,738	17,343,144
Barley	14,714	193,317	2,844,466	105,006	1,545,058	1,299,408	19,762	212,648	4,202,350	117,319	2,318,458	1,883,892	1,357,884	773,400	584,484
Naked Barley	1,870	243,141	454,674	111,722	208,920	245,754	23,096	267,454	6,166,419	124,825	2,877,965	3,288,454	5,711,745	2,669,045	3,042,700
Soybean	3,742	111,964	418,744	68,403	255,964	162,780							- 418,744	- 255,964	- 162,780
Sweet Potato	7,807	512,066	1,437,374	144,448	405,466	1,031,908							-1,437,374	- 405,466	-1,031,908
Chinese Cabbage	935	297,696	278,345	156,172	146,021	132,324							- 278,345	- 146,021	- 132,324
Red Pepper	935	376,480	352,008	251,617	235,262	116,746							- 352,008	- 235,262	- 116,746
Total	73,233	300,123*	23,470,537	141,366*	10,135,679	13,334,858	108,692	355,573*	49,011,577	136,142*	16,150,149	32,861,428	25,541,040	6,014,470	19,526,570

*Non-weighted average
**Excluding water charges

Excerpts from "Report on Irrigation Projects
Korea
Proposed for AID Loan"
William D. Romig, Consultant

The Sin-gog (or Shingok) Pumping Station was visited on February 19, accompanied by Mr. Howe of AID/W. It is number 5 in Kyeong-gi on the location map and is situated on the Han River, north and slightly west of the Kimpo Airport (Seoul). This is a large plant containing 5 sets of pumps (7.5 m^3/sec each) driven by 5 electric motors (1050 hp each) constructed by the Torishima Pump Company, of Japan. These were provided by Japan as an item of 'reparations". They can pump water into the canal for irrigation or out of the canal for drainage, with the help of a gate system. Two additional channels have been provided to pass water by

gravity when the water levels are favorable and the pumps are not required. All functions are automated, from a central control board. This plant was constructed and all equipment installed by a Korean contractor. The plans necessary to the installation of equipment were provided by the manufacturer who also provided the usual installation supervision. Other portions of the pumping plant were designed by the ADC. Gates and incidental parts were fabricated in Korea.

The pumping plant is designed to serve a total project area of 15,926 ha., in four stages of development. This main plant will directly serve 11,606 ha. The rest requires relift pumping plants. The Singog pumping plant was completed and one of the pumps put into use during 1973. However, the major part must remain unused until additional construction is completed on canals and two of the three relift pumping stations are finished. The main plant and one of the relift pumping plants that is also built can serve a total of 13,266 hectares when the necessary canal work is finished. However, of this about 10,000 hectares has been irrigated and some more can now be served. Thus about 2,600 hectares of new irrigation can be served with relatively modest investments in canals and distribution channels, under the Keyang relift plant. Two additional relift plants are planned: the Kochang plant will irrigate 810 ha and the Kahyun plant will serve 1,850 ha.

The cost estimates of the ADC are not subdivided along the lines of this stage development. Instead they are grouped by associated work items. Therefore, a clean-cut costing by stages is not possible at this time. For example, the existing Kimpo Canal must be enlarged to supply water to the relift pumping plants. This canal enlargement is estimated at ₩511,000,000 ($1,280,000) and this cost should be distributed among the three relift stages. This has been done in the table below by guess based on map distances.

An approximate cost estimate of the Sin-gog project by stages is as follows:

Stage (controlling feature)	Hectares	Cost Estimate $
Keyang relift Plant	2,600	3,000,000
Kochang relift Plant	810	1,900,000
Kahyun relift Plant	1,850	4,700,000
Total	4,260	9,600,000

The foregoing estimates are close enough for discussion. That for the Keyang stage probably is wit in about 10% of the current estimates (subject to escallation). The other two might be as much as 20% in error due to errors in my guesses in dividing the costs of canal enlargement and other such costs not obtained on the stage basis.

As suggested above, the stage concept for Sin-gog is slighty confused since parts of the enlarged channels carry water for more than one stage of development. This does not present major difficulties except that some care should be exercised to assure that an early stage is not credited with expenditures appropriately allocated to later stage, in any such joint features. Joint features might also include electrical substations and power lines. The main Sin-gog pumping plant is another joint feature, but it offers no problem to the AID loan as it is already built and paid for.

The FLIA that will operate and maintain the entire system (eventually serving 15,926 hectares) is reported to have about 200 "engineers" plus some trainees and the usual assortment of skilled labor and support personnel. ADC engineers expressed the view that this FLIA could handle almost any repairs to the large pumping plant and other facilities except major

rehabilitation of the 5 large pumps and motors. Such major work would be contracted to private shops or to the ADC which has machine tools capable of handling this work. Considering that this FIIA has successfully handled a project (including pumps) serving 8,926 ha. for a period of about 50 years, there seems to be no reason to question its ability to handle the expanded project.

The ADC estimates that, without problems of funding, that the entire scheme to be served from the Sin-gog pumping plant (15,926 ha) might be completed in about three years. All designs are said to be completed. Considering that the large pumping plant was finished in less than two years, it appears that the two additional relift plants and various canals and distribution could be completed within this three year period (maybe some minor "clean-up elements might extend beyond that period).

The Sin-gog installation and the four-stage development to be served by it are considered to be of special significance in the examination of the proposed loan. Its magnitude and complexity provide a good test of the capabilities of the Korean organizations. The pumping station exibits good workmanship and organizational capabilities. Although the concrete above groundlevel was stuccoed and painted, the pump well, discharge bay, and gate structures had exposed concrete exhibiting good quality for the purpose (rather severe service). The site visit quickly established confidence in the ADC to design and construct major works.

On February 23, the Na Po project (#5 in Jun-buk) was visited. The information in the application is not fully descriptive. This site is a short distance northeast of Kunsan and will irrigate lands mainly near the Kum River using water pumped from a smaller river to the south, with a modest sized off-channel reservoir to reregulate the flows. The pumping facilities (a plant at the river and two booster plants) are finished. Some work is completed on the pipelines from the pumps and a tunnel. The major remaining work is on the dam (now 40% complete) and canals and distribution system. Most of the earth fill on the dam has been placed but a spillway, outlet works and stone facing are still needed. The embankment work appears acceptable. On this job there is a single contractor for all work. Inspection is maintained by the ADC and the FLIA.

The An-Deog dam (#2 in Jun-bug) was visited on February 24. This is located roughly 30 km (straight line) south of Jeon-ju. It is about 75% complete, needing mainly a few meters more height, the completion of stone face, and a spillway. The outlet works are done. With an embankment height of 22.3 m (about 65 feet) this must be classed as a sizeable dam. It is mainly rock fill with a compacted earth core. The workmanship and the core density appear good. The geology of the site is reasonably good granite, judging from the excavation for the dam abutments and spillway. This dam is mentioned further under the heading "Feasibility Studies".

Enroute to An-Deog we passed a rather large dam built about 20 years ago using only Korean tallent. Car window observation suggested excellent condition of the dam and only minor deposition of sediments, gravel, and debris at the head of the reservoir.

AID-DLC/P-2025
May 14, 1974

AID-DLC/P-
Annex B

CERTIFICATION PURSUANT TO SECTION 611(e) OF

THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Michael H. B. Adler, the principal officer of the Agency for International Development in Korea, having taken into account, among other things, the maintenance and utilization of projects in Korea previously financed or assisted by the United States, do hereby certify that in my judgement Korea has both the financial capability and the human resources capability to effectively utilize the assistance to be provided under the Small/Medium Scale Irrigation Project.

Michael H. B. Adler

19 March 1974
Date

(March 28, 1974)

STATUTORY CHECKLIST

(Irrigation Project)

(Loan No. 489-H-089)

I. FULFILLMENT OF STATUTORY OBJECTIVES

A. Needs which the Loan is Addressing

1. FAA Section 103. Discuss the extent to which the loan will alleviate starvation, hunger and malnutrition, and will provide basic services to poor people enhancing their capacity for self-help.

1. Increased grain production resulting from this loan will replace grain imports, with little change in the composition of Korean diets. There is no general problem of starvation and hunger in Korea. The loan, however, will assist up to approximately 95,000 farm families with an average farm size of about 2 acres to significantly increase their incomes.

2. FAA Section 104. Discuss the extent to which the loan will increase the opportunities and motivation for family planning; will reduce the rate of population growth; will prevent and combat disease; and will help provide health services for the great majority of the population.

2. The loan is not intended for such purposes.

3. FAA Section 105. Discuss the extent to which the loan will reduce illiteracy, extend basic education, and increase manpower training in skills related to development.

3. The loan is not intended for such purposes.

4. FAA Section 106. Discuss the extent to which the loan will help solve economic and social development problems in fields such as transportation, power, industry, urban development, and export development.	4. The loan is not intended to help solve such problems.
5. FAA Section 107. Discuss the extent to which the loan will support the general economy of the recipient country; or will support development programs conducted by private or international organizations.	5. The loan is supportive of the agricultural economy through increased production.

B. Use of Loan Funds

1. FAA Section 110. Has the intended recipient country provided satisfactory assurances that it will provide at least 25% of the costs of the entire program, project or activity with respect to which such assistance is to be furnished under Sections 103 - 107 of the FAA?	1. The loan agreement will so provide and the planned administrative arrangements will assure it.

2. FAA Section 111. Discuss the extent to which the loan will strengthen the participation of the urban and rural poor in their country's development, and will assist in the development of cooperatives which will enable and encourage greater numbers of poor people to help themselves toward a better life.

2. The loan will strengthen the Farm Land Improvement Associations which are farmer associations. Due to land reform almost all Korean farmers are land owners and all farmers in the project area are small and relatively poor.

3. FAA Section 112. Will any part of the loan be used to conduct any police training or related program (other than assistance rendered under Section 515(c) of the Omnibus Crime Control and Safe Streets Act of 1968 or with respect to any authority of the Drug Enforcement Administration or the FBI) in a foreign country?

3. No.

4. FAA Section 113. Describe the extent to which the programs, projects or activities to be financed under the loan give particular attention to the integration of women into the national economy of the recipient country.

4. This loan is not intended for such purpose.

5. FAA Section 114. Will any part of the loan be used to pay for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions?

5. No.

II. COUNTRY PERFORMANCE

A. Progress Towards Country Goals

1. FAA Secs. 201(b)(5), 201(b)(7), 201(b)(8), 208. Discuss the extent to which the country is:

(a) Making appropriate efforts to increase food production and improve means for food storage and distribution.

1(a). From 1962 through 1972 the National Income accounts show that the real value added in the agriculture sector increased by approximately 55% (a growth rate of 4.5% per year). Significantly, this period included the two drought years of 1967 and 1968; however, significant investments have been and are being made in irrigation facilities which will minimize future weather influences on production.

Beginning in 1970, the ROKG adopted a high rice price policy and significantly increased rice prices relative to other prices. Rice prices were increased 23% on 1970, 35% in 1971 and 25% in 1972. Since then prices have been increased approximately in line with increases in the general price level. These increases have provided additional incentive for farmers to use fertilizer and other inputs required to increase production.

Under loan 489-H-088 for agricultural research, substantial effort and expenditure will be made to develop and introduce new crop varieties. Under previous A.I.D. assistance, food storage capacity was improved and increased.

(b) Creating a favorable climate for foreign and domestic private enterprise and investment;

1(b). Korea has taken a number of effective steps to create a favorable investment climate. A liberal foreign investment law was enacted, and intensive study is being undertaken by the ROKG of means of expanding capital markets. An investment center has been established, and domestic investment has been assisted by a number of A.I.D. loans such as the loans to the Korea Development Bank.

(c) Increasing the people's role in the developmental process;	1(c). Koreans are basically a homogeneous people whose society is relatively free and politically stable. Korea does not possess deep sectional, religious or social cleavages. Korea's rapid economic development benefits increasingly larger segments of the population.
(d) Allocating expenditures to development rather than to unnecessary military purposes or intervention in other free countries' affairs;	1(d). Korea has wisely allocated its resources in such a way as to maximize its economic development while maintaining sufficient military forces to insure a relative freedom from threatened external aggression. Korea is not intervening in other free and independent nations' affairs.
(e) Willing to contribute funds to the project or program;	1(e). The ROKG will provide at least 25% of the total capital cost of the project.
(f) Making economic, social and political reforms such as tax collection improvements and changes in land tenure arrangement; and making progress toward respect for the role of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise;	1(f). Korean land reform programs have eliminated the large landholding class and have created a large number of independent farmers who own their own small farms. The ROKG has assisted in the establishment of a number of farm and fishery cooperatives which have been of significant assistance to the farm and fishery communities. Korea basically has a private enterprise type economy. AID has assisted the ROKG in its efforts to reform the equity of tax rates and collection procedures. These reforms have greatly increased both the amount of taxes collected and the equity with which the program is administered.

On October 17, 1972, the President of Korea declared martial law, giving as reasons domestic and international political developments. Under the martial law, political liberties were restricted and the Korean press was placed under tight control. A new constitution has since been adopted and martial law lifted on December 13, 1972, but restrictions on political activity and press freedom continue.

(g) Responding to the vital economic, political and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

1(g). The ROKG has made significant progress in its efforts to provide a better life for the average Korean citizen. The Government has encouraged the rapid expansion of small and medium industry, stimulated the development of farmer credit unions and fishing cooperatives and has helped in many other ways to better the lot of its people. Korea already has a high literacy rate and is concerned about extending better health care to all its people.

B. Relations with the United States

1. FAA Sec. 620(c). If assistance is to a government is the government indebted to any U.S. citizen for goods or services furnished or ordered where: (a) such citizen has exhausted available legal remedies, including arbitration, or (b) the debt is not denied or contested by the government, or (c) the indebtedness arises under such government's or a predecessor's unconditional guarantee?

1. No such situation is known to exist.

2. FAA Sec. 620(d). If the loan is intended for construction or operation of any productive enterprise that will compete with U.S. enterprise, has the country agreed that it will establish appropriate procedures to prevent export to the U.S. of more than 20% of its enterprises annual production during the life of the loan?	2. The loan is not intended for such purposes.
3. FAA Sec. 620(e)(1). If assistance is to a government has the country's government, or any agency or subdivision thereof, (a) nationalized or expropriated property owned by U.S. citizens or by any business entity not less than 50% beneficially owned by U.S. citizens, (b) taken steps to repudiate, or nullify exisiting contracts or agreements with such citizens or entity, or (c) imposes or enforced discriminatory taxes or other exactions, or restrictive maintenance or operation conditions? If so, and more than six months has elapsed since such occurrence, identify the document indicating that the government, or appropriate agency or subdivision thereof, has taken appropriate steps to discharge its obligations under international law toward such citizen or entity? If less than six months has elapsed, what steps if any has it taken to discharge its obligations?	3. No such actions are known to have occured.

4. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property, and failed to take appropriate measures to prevent a recurrence and to provide adequate compensation for such damage or destruction?	4. No such situation is known to have occurred.
5. FAA Sec. 620(l). Has the government instituted an investment guaranty program under FAA Sec. 221 (b)(1) for the specific risks of inconvertibility and expropriation or confiscation?	5. Yes.
6. FAA Sec. 620(o). Fisherman's Protective Act of 1954, as amended, Section 5. Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters? If, as a result of a seizure, the U.S.G. has made reimbursement under the provisions of the Fisherman's Protective Act and such amount has not been paid in full by the seizing country, identify the documentation which describes how the withholding of assistance under the FAA has been or will be accomplished.	6. No.
7. FAA Sec. 620(q). Has the country been in default, during a period in excess of six months, in payment to the U.S. on any FAA loan?	7. No.
8. FAA Sec. 620(t). Have diplomatic relations between the country and the U.S. been severed? If so, have they been renewed?	8. Diplomatic relations between Korea and the United States have not been severed.

C. Relations with Other Nations and the U.N.

1. FAA Sec. 620(i). Has the country been officially represented at any international conference when that representation included planning activities involving insurrection or subversion directed against the U.S. or countries receiving U.S. assistance?

1. Korea is not known to have been so represented.

2. FAA Secs. 620(a), 620(n). Has the country sold, furnished, or permitted ships or aircraft under its registry to carry to Cuba or North Vietnam, items of economic, military or other assistance?

2. No.

3. FAA Sec. 620(u); App. Sec. 107. What is the status of the country's U.N. dues, assessments or other obligations? Does the loan agreement bar any use of funds to pay U.N. assessments, dues or arrearages?

3. The Republic of Korea is not a member of the United Nations. The loan agreement will stipulate that only eligible commodities and services can be procured with the proceeds of the loan.

D. Military Situation

1. FAA Sec. 620(i). Has the country engaged in or prepared for aggressive military efforts directed against the U.S. or countries receiving U.S. assistance?

1. No.

2. FAA Sec. 620(s).
(i) What is:
(a) the percentage of the country's budget devoted to military purposes, and

2.
(i)
(a) For the period 1971-1974, Korean defense budget expenditures have averaged 4.0 percent of GNP. In 1974, these expenditures were budgeted at 3.5 percent of GNP. Defense accounted for 27 percent of the national budget during 1971-1974 and 28 percent in 1974.

(b) the amount of the country's foreign exchange resources used to acquire military equipment, and

(b) Foreign exchange purchases of military items were slightly more than $1 million annually in 1972

and 1973, a negligible portion of both the defense budget and total imports. However, this excludes a substantial amount of Foreign Military Sales Credit Purchases for which no foreign exchange has been expended as yet.

(c) has the country spent money for sophisticated weapons systems purchased since the statutory limitation became effective?

(c) No

(ii) Is the country diverting U.S. development assistance or PL 480 sales to military expenditures?

(ii) The Department of State and A.I.D. have reviewed Korean actions under the Symington Amendment and have concluded that Korea is not diverting U.S. development assistance or PL 480 sales to military purposes.

(iii) Is the country diverting its own resources to unnecessary military expenditures? (Findings on these questions are to be made for each country at least once each fiscal year and, in addition, as often as may be required by a material change in relevant information.)

(iii) They also determined that Korea is not diverting its own resources to to unnecessary military expenditures to a degree which materially interferes with its development. The Country Team concurs.

III. CONDITION OF THE LOAN

A. General Soundness

Interest and Repayment

1. FAA Secs. 201(d), 201(b)(2). Is the rate of interest excessive or unreasonable for the borrower? Are there reasonable prospects for repayment? What is the grace period interest rate; the following period interest rate? Is the rate of interest higher than the country's applicable legal rate of interest?

1. The proposed loan contains a rate of interest which is concessionary. The borrower has the capacity to repay the loan at the rates of interest to be required. The rates in the proposed loan are 2% per annum during the grace period and 3% per annum thereafter for the remaining thirty years of the repayment period. The interest rate is not higher than the country's applicable legal rate of interest.

Financing

1. FAA Sec. 201(b)(1). To what extent can financing on reasonable terms be obtained from other free-world sources, including private sources within the U.S.?

1. Financing of this activity on terms comparable to those proposed for this loan is believed not to be available from other free-world sources, including private sources within the U.S.

Economic and Technical Soundness

1. FAA Secs. 201(b)(2), 201(e). Does the loan application, together with information and assurances, indicate that funds will be used in an economically and technically sound manner?	1. The activity is economically and technically sound, and the loan application and other information available to the Mission indicates that the loan funds will be used in an economically and technically sound manner.
2. FAA Sec. 611(a)(1). Have engineering, financial, and other plans necessary to carry out assistance, and a reasonable firm estimate of the cost of assistance to the U.S., been completed?	2. Yes.
3. FAA Sec. 611(b); App. Sec. 101. If the loan or grant is for a water or related land-resources construction project or program, do plans include a cost-benefit computation? Does the project or program meet the relevant U.S. construction standards and criteria used in determining feasibility?	3. Yes.
4. FAA Sec. 611(e). If this is a Capital Assistance Project with U.S. financing in excess of $1 million, has the principal A.I.D. officer in the country certified as to the country's capability effectively to maintain and utilize the project?	4. The principal A.I.D. officer in Korea has so certified (see Annex B).

B. Relation to Achievement of Country and Regional Goals

Country Goals

1. FAA Secs. 207, 281(a). What is this loan's relation to:

a. Institutions needed for a democratic society and to assure maximum participation on the part of the people in the task of economic development?

b. Enabling the country to meet its food needs both from its own resources and through development, with U.S. help, of infrastructure to support increased agricultural productivity?

c. Meeting increasing need for trained manpower?

d. Developing programs to meet public health needs?

e. Assisting other important economic, political, and social development activities, including industrial development; growth of free labor unions; cooperatives and voluntary agencies; improvement of transportation and communication systems; capabilities for planning and public administration; urban development; and modernization of existing laws?

1. The small/medium-scale irrigation systems to be financed under this loan are directed specifically toward enabling Korea to better meet its food needs through increased productivity and the arable land base. These systems will be operated and maintained by associations of farmers (Farm Land Improvement Associations).

There is no direct relation to items c., d., and e.

2. FAA Sec. 201(b)(4). Describe the activity's consistency with and relationship to other development activities, and its contribution to realizable long-range objectives.

2. The proposed irrigation project is consistent with the ROKG's overall efforts to increase the growth rate of the agriculture sector and improve the country's ability to meet its food needs.

3. FAA Sec. 201(b)(9). How will the activity to be financed contribute to the achievement of self-sustaining growth?	3. Through contribution of increased food production and higher rural incomes.
4. FAA Sec. 201(f). If this is a project loan, describe how such project will promote the country's economic development, taking into account the country's human and material resource requirements and the relationship between ultimate objectives of the project and overall economic development.	4. See 2. and 3. above.
5. FAA Sec. 201(b)(3). In what ways does the activity give reasonable promise of contributing to development of economic resources, or to increase of productive capacities?	5. See 1., 2., and 3. above.
6. FAA Sec 281(b). How does the program under which assistance is provided recognize the particular needs, desires, and capacities of the country's people; utilize the country's intellectual resources to encourage institutional development; and support civic education and training in skills required for effective participation in political processes.	6. It recognizes the need and desire of small farmers for increased incomes and improvement in the quality of life. Also it recognizes the general priority given to achieving to the extent possible self-sufficiency in the domestic production of grains. There will be greated participation in the Farm Land Improvement Associations.
7. FAA Sec. 601(a). How will this loan encourage the country's efforts to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions?	7. There is no direct relationship between this loan and the objectives stated in Sec. 601(a) of the Foreign Assistance Act, except for improving the technical efficiency of agriculture and strengthening the cooperative effort through farmer participation in the Farm Land Improvement Associations.

8. FAA Sec. 202(a). Indicate the amount of money under the loan which is: going directly to private enterprise; going to intermediate credit institutions or other borrowers for use by private enterprise; being used to finance imports from private sources; or otherwise being used to finance procurements from private sources.

8. All of the loan will be used to finance the procurement of equipment, materials, and services from private sources. The beneficiaries of the project will all be private farmers.

9. FAA Sec. 611(a)(2). What legislative action is required within the recipient country? What is the basis for a reasonable anticipation that such action will be completed in time to permit orderly accomplishment of purposes of loan?

9. No legislative action is required other than passage of the Supplemental Budget to meet the CP for the advance. Although passage of the Supplementary Budget is practically assured by virture of the backing of the ROKG, its failure would merely remove the possiblity of an advance and stretch out AID disbursements over a three year period instead of two. See Chapter III , d.

Regional Goals

1. FAA Sec. 619. If this loan is assisting a newly independent country, to what extent do the circumstances permit such assistance to be furnished through multilateral organizations or plans?

1. Korea is not a newly independent nation.

2. FAA Sec. 209. If this loan is directed at a problem or an opportunity that is regional in nature, how does assistance under this loan encourage a regional development program? What multilateral assistance is presently being furnished to the country?

2. This loan is not directed at a regional problem.

Korea is a member of the Asian Development Bank (ADB) and is receiving assistance from the World Bank. Both of these organizations are beoming increasingly active in Korea.

C. Relation to U.S. Economy

Employment, Balance of Payments, Private Enterprise.

1. FAA Secs. 201(b)(6); 102. What are the possible effects of this loan on U.S. economy, with special reference to areas of substantial labor surplus? Describe the extent to which assistance is constituted of U.S. commodities and services, furnished in a manner consistent with improving the U.S. balance of payments position.

1. The loan should result in up to 72,000 metric tons of additional rice production per year. This will occur earlier than would be the case if the loan were not made. To the extent this rice or substitute grain would have been imported from the United States on a commercial basis, this loan will have an adverse effect on the U.S. economy. As far as loan dollars are concerned these will be used exclusively for financing U.S. goods and services.

2. FAA Secs. 612(b); 636(h). What steps have been taken to assure that, to the maximum extent possible, foreign currencies owned by the U.S. and local currencies contributed by the country are utilized to meet the cost of contractual and other services, and that U.S. foreign owned currencies are utilized in lieu of dollars?

2. Korea is not an excess currency country. Local costs in excess of 25% will be contributed by Korea.

3. FAA Sec 601(d); App. Sec. 108. If this loan is for a capital project, to what extent has the Agency encouraged utilization of engineering and professional services of U.S. firms and their affiliates? If the loan is to be used to finance direct costs for construction, will any of the contractors be persons other than qualified nationals of the country or qualified citizens of the U.S.? If so, the required waiver been obtained?

3. It has been determined that Korea has adequate engineering services to complete this project, the components of which have already been designed. A provision of the loan agreement will restrict the use of third-country nationals in the construction of the irrigation systems.

4. FAA Sec. 608(a). Provide information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items.	4. U.S. Government Excess Property is not appropriate for use in the activity to be financed hereunder.
5. FAA Sec. 602. What efforts have been made to assist U.S. small business to participate equitably in the furnishing of commodities and services financed by this loan?	5. Not applicable to the Special Letter of Credit procedure being utilized.
6. FAA Sec. 621. If the loan provides technical assistance, how is private enterprise on a contract basis utilized? If the facilities of other Federal agencies will be utilized, in what ways are they particularly suitable; are they competitive with private enterprise (if so, explain); and how can they be made available without undue interference with domestic programs?	6. No portion of the project involves the financing of technical assistance.
7. FAA Sec. 611(c). If this loan involves a contract for construction that obligates in excess of $100,000, will it be on a competitive basis? If not, are there factors which make it impracticable.	7. All construction contracts were let on a competitive basis.
8. FAA Sec. 601(b). Describe the efforts made in connection with this loan to encourage and facilitate participation of private enterprise in achieving the purposes of the Act.	8. Local private contractors have been and will continue to be employed in the construction of the irrigation systems. All the farmer beneficiaries of the project are private entrepeneurs.
Procurement	
1. FAA Sec. 604(a). Will commodity procurement be restricted to U.S. except as otherwise determined by the President?	1. Commodity procurement will be limited to Korea and the U.S.

2. FAA Sec. 604(b). Will any part of this loan be used for bulk commodity procurement at adjusted prices higher than the market price prevailing in the U.S. at time of purchase?

2. No.

3. FAA Sec. 604(e). Will any part of this loan be used for procurement of any agricultural commodity or product thereof outside the U.S. when the domestic price of such commodity is less than parity?

3. No.

4. FAA Sec. 604(f). Will the agency receive the necessary prepayment certification from suppliers under a commodity import program agreement as to description and condition of commodities, and on the basis of such, determine eligibility and suitability for financing?

4. Not applicable under the Special Letter of Credit procedures planned.

D. Other Requirements

1. FAA Sec. 201(b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year?

1. Yes.

2. App. Sec. 105. Does the loan agreement provide, with respect to capital projects, for U.S. approval of contract terms and firms?

2. To the extent Section 105 is applicable the contracts and contractors will be approved, such approval to be conducted in accord with the spirit in which the project was undertaken and with due regard to the respective duties & obligations of the ROKG.

3. FAA Sec. 620(k). If the loan is for construction of a production enterprise, with respect to which the aggregate value of assistance to be furnished will exceed $100 million, what preparation has been made to obtain the express approval of the congress?

3. Not applicable.

4. FAA Secs. 620(b), 620(f). Has the President determined that the country is not dominated or controlled by the international Communist movement? If the country is a Communist country (including, but not limited to, the countries listed in FAA Sec. 620(f)) and the loan is intended for economic assistance, have the findings required by FAA Sec. 620(f) and App. Sec. 109(b) been made and reported to the Congress?	4. Yes, the required determination has been made.
5. FAA Sec. 620(h). What steps have been taken to insure that the loan will not be used in a manner which, contrary to the best interest of the United States, promotes or assists the foreign aid projects of the Communist-bloc countries?	5. There are no Communist Bloc foreign aid projects in Korea. In addition the Loan Agreement will contain a provision covering this requirement.
6. App. Sec. 109. Will any funds be used to finance procurement of iron and steel products for use in Vietnam other than as contemplated by Sec. 109?	6. No.
7. FAA Sec. 636(i). Will any part of this loan be used in financing non-U.S.-manufactured automobiles? If so, has the required waiver been obtained?	7. Non-U.S.-manufactured automobiles will not be financed.
8. FAA Secs. 620(a)(1) and (2), 620(p). Will any assistance be furnished or funds made available to the government of Cuba or the United Arab Republic?	8. No.
9. FAA Sec. 620(g). Will any part of this loan be used to compensate owners for expropriated or nationalized property? If any assistance has been used for such purpose in the past, has appropriate reimbursement been made to the U.S. for sums diverted?	9. No. No assistance has been used for such purposes in the past.

10. FAA Sec. 201(f). If this is a project loan, what provisions have been made for appropriate participation by the recipient country's private enterprise?	10. Local private contractors will be employed in the construction of the irrigation systems.
11. App. Sec. 103. Will any funds under the loan be used to pay pensions, etc., for persons who are serving or who have served in the recipient country's armed forces?	11. No. Funds will be restricted to project use only.
12. MMA Sec. 901.b. Does the loan agreement provide for compliance with U.S. shipping requirements, that at least 50% of the gross tonnage of all commodities financed with funds made available under this loan (computed separately by geographic area for dry bulk carriers, dry cargo liners, and tankers) be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates for U.S. flag vessels and that at least 50% of the gross freight revenue generated by all shipments financed with funds made available under this loan and transported on dry cargo liners be paid to or for the benefit of privately owned U.S. flag commercial vessels?	12. Not applicable under the Special Letter of Credit procedures planned.
13. FAA Sec. 481. Has the President determined that the recipient country has failed to take adequate steps to prevent narcotic drugs produced or procured in, or transported through, such country from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents or from entering the United States unlawfully?	13. No.

14. App. Sec. 110. Is the loan being used to transfer funds to world lending institutions under FAA Sec. 209(d) and Sec. 251(h)?	14. No.
15. App. Sec. 601. Are any of these funds being used for publicity or propaganda within the United States?	15. No.
16. FAA Sec. 612(d) and Sec. 40 of PL 93-189 (FAA of 1973). Does the United States own host country excess foreign currency and, if so, what arrangements have been made for its release?	16. Korea is not an excess-currency country.
17. FAA Sec. 604(d). Will provisions be made for placing marine insurance in the U.S. if the recipient country discriminates against any marine insurance company authorized to do business in the U.S.?	17. Not applicable under the Special Letter of Credit procedures planned.
18. Section 29 of PL 93 - 189 (FAA of 1973). Is there a military base located in the recipient country which base was constructed or is being maintained or operated with funds furnished by the U.S., and in which U.S. personnel carry out military operations? If so, has a determination been made that the government of such recipient country has, consistent with security, authorized access, on a regular basis to bona fide news media correspondents of the U.S. to such military base?	18. See Presidential Determination No. 74-14, made January 28, 1974.
19. Section 30 and 31 of PL 93 - 189 (FAA of 1973). Will any part of the loan be used to finance directly or indirectly military or paramilitary operations by the U.S. or by foreign forces in or over Laos, Cambodia, North Vietnam, South Vietnam, or Thailand?	19. No.

20. Section 32 of PL 93 - 189 (FAA of 1973). With respect to the interment or inprisonment of the recipient country's citizens for political purposes, does the recipient country adhere to the United Nations Universal Declaration on Human Rights?	20. The ROKG follows a course of action which respects the principles of the Declarn-tion.
21. Section 37 of PL 93 - 189 (FAA of 1973): App. Sec. 111. Will any part of this loan be used to aid or assist generally or in the reconstruction of North Vietnam?	21. No.
22. FAA Section 640(c). Will a grant be made to the recipient country to pay all or part of such an ocean freight differential as is determined by the Secretary of Commerce to exist between U.S. foreign flag vessel charter or freight rates?	22. No.
23. App. Sec. 112. Will any of the funds appropriated or local currencies generated as a result of AID assistance be used for support of police or prison construction and administration in South Vietnam or for support of police training of South Vietnamese?	23. No.
24. App. Sec. 113. Will any of the loan funds be used to acquire currency of the recipient country from non-U.S. Treasury sources when excess currency of that country is on deposit in the U.S. Treasury	24. Korea is not an excess-currency country.
25. App. Sec. 114. Have the House the Senate Committees on Appropriations been notified five days in advance of the availability of funds for the purposes of this project.	25. This will be done before the loan is authorized.
26. App. Sec. 604. Will any of the funds appropriated for this project be used to furnish petroleum fuels produced in the continental United States to Southeast Asia for use by non-U.S. nationals.	26. No.

DRAFT

LOAN AUTHORIZATION

Provided from: Food and Nutrition
(Korea: Irrigation Project)

Pursuant to the authority vested in me as Administrator, Agency for International Development (A.I.D.), by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter 1, Section 103 and Chapter 2, Title I, the Development Loan Fund, to the Government of the Republic of Korea (Borrower) of not to exceed Seventeen Million Two Hundred Thousand Dollars ($17,200,000) to be made available to assist in financing the local currency costs of completing the construction of a number of small/medium-scale irrigation systems. The loan is to be subject to the following terms and conditions:

1. Interest Rate and Terms of Repayment

This loan shall be repaid by the Government of Korea within forty (40) years after the date of the first disbursement thereunder including a grace period of not to exceed ten (10) years from the date of the first disbursement. The interest on the unrepaid principal balance of the loan shall accrue from the date of the first disbursement at the rate of two percent (2%) per annum during the grace period and at the rate of three percent (3%) per annum throughout the remaining life of the loan.

2. Currency of Repayment

Provision shall be made for repayment of the loan and payment of the interest in United States dollars.

3. Other Terms and Conditions

a. Borrower shall be reimbursed in U.S. dollars for up to seventy five percent (75%) of the local currency it has disbursed for costs of completing approved subprojects through the establishment by A.I.D. of a Special Letter of Credit(s) in a U.S. commercial bank(s).

b. Unless A.I.D. agrees otherwise in writing, project equipment, materials and services financed under this loan shall have their source and origin in Korea or in countries included in A.I.D. Geographic Code 941 (Selected Free World).

c. The loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

_____
Administrator

_____
Date